

- Abbott T, Peterson R, McAlpine J et al (1989) Comparing centrifugal countercurrent chromatography, nonaqueous reversed phase HPLC and AG ion exchange HPLC for the separation and characterization of triterpene acetates. *J Liq Chromatogr & Rel Technol* 12:2281-2301
- Abbott TP, Kleiman R (1991) Solvent selection guide for counter-current chromatography. *J Chromatogr* 538:109-118
- Acton N, Klayman DL, Rollman IJ et al (1986) Isolation of artemisinin (ginghaosu) and its separation from artemisitene using the Ito multilayer coil separator-extractor and isolation of arteannuin B. *J Chromatogr* 355:448-450
- Adhami HR, Viljoen AM (2014) Preparative isolation of bio-markers from the leaf exudate of *Aloe ferox* ("aloe bitters") by high performance counter-current chromatography. *Phytochem Lett* doi:10.1016/j.phytol.2014.07.001
- Agostinho D, Boudesocque L, Thery-Kone I et al (2013) A new meroterpenoid isolated from roots of *Ptaeroxylon obliquum* Radlk. *Phytochem Lett* 6:560-566
- Aman R, Carle R, Conrad J et al (2005) Isolation of carotenoids from plant materials and dietary supplements by high-speed counter-current chromatography. *J Chromatogr A* 1074:99-105
- Amira-Guebailia H, Valls J, Richard T (2009) Centrifugal partition chromatography followed by HPLC for the isolation of cis-e-viniferin, a resveratrol dimer newly extracted from a red Algerian wine. *Food Chem* 113:320-324
- Angelis A, Urbain A, Halabalaki M et al (2011) One-step isolation of γ -oryzanol from rice bran oil by non-aqueous hydrostatic countercurrent chromatography. *J Sep Sci* 34:2528-2537
- Assimopoulou AN, Sturm S, Stuppner H et al. (2009) Preparative isolation and purification of alkannin/shikonin derivatives from natural products by high-speed counter-current chromatography. *Biomed Chromatogr* 23:182-198
- Attoumbré J, Giordanengo P, Baltora-Rosset S (2013) Solanidine isolation from *Solanum tuberosum* by centrifugal partition chromatography. *J Sep Sci* 36:2379-2385
- Attoumbré J, Lesur D, Giordanengo P et al (2012) Preparative separation of glycoalkaloids α -solanine and α -chaconine by centrifugal partition chromatography. *J Chromatogr B* 908:150-154
- Bai HL, Wang J, Liu CM et al (2010) Isolation and purification of flavonoids from *Ziziphus jujuba* by high-speed counter-current chromatography. *J Chin Chem Soc* 57:1071-1076
- Baldermann S, Ropeter K, Köhler N et al (2008) Isolation of all-trans lycopene by high-speed counter-current chromatography using a temperature-controlled solvent system. *J Chromatogr A* 192:191-193
- Baldermann S, Reinhard A, Köhler N et al (2007) Application of high-speed counter-current chromatography for the isolation of 9'-cis-neoxanthin from fresh spinach. *J Chromatogr A* 1151:183-186
- Baudimant G, Maurice M, Landrein A et al (1996) Purification of phosphatidylcholine with high content of DHA from squid *Illex argentinus* by countercurrent chromatography. *J Liq Chromatogr & Rel Technol* 19:1793-1804
- Berhow MA, Polat U, Glinski JA et al (2013) Optimized analysis and quantification of glucosinolates from *Camelina sativa* seeds by reverse-phase liquid chromatography. *Ind Crops Prod* 43:119-125
- Berthod A, Billardello B, Geoffroy S (1999) Polyphenols in countercurrent chromatography. An example of large scale separation. *Analisis* 27:750-757
- Berthod A, Talabardon K, De La Poype F et al (1998) Purification of a flavonoid sample by countercurrent chromatography. *J Liq Chromatogr & Rel Technol* 21:3003-3019
- Bi PY, Dong HR, Yuan YC (2010) Application of aqueous two-phase flotation in the separation and concentration of puerarin from *Puerariae* extract. *Sep Purif Technol* 75:402-406
- Bourdat Deschamps M, Herrenknecht C, Akendengue B et al. (2004) Separation of protoberberine quaternary alkaloids from a crude extract of *Enantia chlorantha* by centrifugal partition chromatography. *J Chromatogr A* 1041:143-152
- Braga FC, Kreis W, Braga de Oliveira A (1996) Isolation of cardenolides from a Brazilian cultivar of *Digitalis lanata* by rotation locular counter-current chromatography. *J Chromatogr A* 756:287-291
- Bringmann G, Teltschik F, Michel M et al (1999) Acetogenic isoquinoline alkaloids ancistrobertsonines B, C, and D as well as 1,2-didehydroancistrobertsonine D from *Ancistrocladus robertsoniorum*. *Phytochemistry* 52:321-332
- Bringmann G, Teltschik G, Schaffer F et al (1998) Ancistrobertsonine A and related naphthylisoquinoline alkaloids from *Ancistrocladus robertsoniorum*. *Phytochemistry* 47:31-35
- Budzynska B, Boguszewska-Czubara A, Kruk-Slomka M et al (2013) Effects of imperatorin on nicotine-induced anxiety- and memory-related responses and oxidative stress in mice. *Physiol Behavior* 122:46-55
- Budzynska B, Boguszewska-Czubara A, Kruk-Slomka M et al. (2014) Effects of imperatorin on scopolamine-induced cognitive impairment and oxidative stress in mice. *Psychopharmacology* DOI 10.1007/s00213-014-3728-6
- Butler MS, Towerzey L, Pham NB et al (2014) Cardenolide glycosides from *Elaeodendron australe* var. integrifolium. *Phytochemistry* 98:160-163
- Campaner dos Santos L, Vilegas W (2001) Preparative separation of the naphthopyranone glycosides by high-speed counter-current chromatography. *J Chromatogr A* 915:259-263
- Cao X, Ito Y (2003) Supercritical fluid extraction of grape seed oil and subsequent separation of free fatty acids by high speed counter current chromatography. *J Chromatogr A* 1021:117-124
- Cao X, Ito Y (2004) Preparation and purification of epigallocatechin by high speed countercurrent chromatography (HSCCC). *J Liq Chromatogr & Rel Technol* 27:145-152
- Cao X, Tian Y, Zhang T et al (1998c) HSCCC separation of a stilbene glucoside from *Polygonum multiflorum* *J Liq Chromatogr & Rel Technol* 21:2897-2904

- Cao X, Tian Y, Zhang T et al (1999) Separation and purification of isoflavones from *Pueraria lobata* by high-speed counter-current chromatography. *J Chromatogr A* 855:709-713
- Cao X, Tian Y, Zhang TY et al (1998a) Separation and purification of 10-deacetylbaocatin III by high-speed counter-current chromatography. *J Chromatogr A* 813:397-401
- Cao X, Tian Y, Zhang TY et al (1998b) Semi-preparative separation and purification of taxol analogs by high-speed countercurrent chromatography. *Prep Biochem Biotechnol* 28:79-87
- Cao X, Tian Y, Zhang TY, Liu QH et al (2003) Separation of dammarane-saponins from notoginseng, root of *Panax notoginseng* (burk.) F.H. Chen by HSCCC coupled with evaporative light scattering detector. *J Liq Chromatogr & Rel Technol* 26:1579-1591
- Cao X, Wang C, Pei H et al (2009a) Separation and identification of polyphenols in apple pomace by high-speed counter-current chromatography and high-performance liquid chromatography coupled with mass spectrometry. *J Chromatogr A* 1216:4268-4274
- Cao X, Wang Q, Li Y et al (2011) Isolation and purification of series bioactive components from *Hypericum perforatum* L. by counter-current chromatography. *J Chromatogr B* 879:480-488
- Cao X, Wei Y, Ito Y (2009b) Preparative isolation of isorhamnetin from *Stigma maydis* using high speed countercurrent chromatography. *J Liq Chromatogr & Rel Technol* 32:273-280
- Cao X, Dong Y, Zhao H et al (2005) Preparative separation of a minor active chromone from *Aloe vera* leaves by CCC. *J Liq Chromatogr & Rel Technol* 28:2005-2016
- Cao X, Huang D, Dong Y et al (2007) Separation of aloins A and B from *Aloe vera* exudates by high speed countercurrent chromatography. *J Liq Chromatogr & Rel Technol* 30:1657-1668
- Cao XL, Lewis JR, Ito Y (2004) Application of HSCCC to the separation of black tea theaflavins. *J Liq Chromatogr & Rel Technol* 27:1893-1902
- Cao XL, Tian Y, Zhang TY et al (2000) Supercritical fluid extraction of catechins from *Cratoxylum prunifolium* Dyer and subsequent purification by high-speed counter-current chromatography. *J Chromatogr A* 898:75-81
- Cao XL, Xu J, Bai G et al. (2013) Isolation of anti-tumor compounds from the stem bark of *Zanthoxylum ailanthoides* Sieb. & Zucc. by silica gel column and counter-current chromatography. *J Chromatogr B* 929:6-10
- Cazal CdM, Batalhão JR, Domingues VdC et al (2009) High-speed counter-current chromatographic isolation of ricinine, an insecticide from *Ricinus communis*. *J Chromatogr A* 1216:4290-4294
- Cerezo AB, Cuevas E, Winterhalter P et al (2010) Isolation, identification, and antioxidant activity of anthocyanin compounds in *Camarosa* strawberry. *Food Chem* 123:574-582
- Chadwick LR, Fong HHS, Farnsworth NR et al. (2005) CCC sample cutting for isolation of prenylated phenolics from hops. *J Liq Chromatogr & Rel Technol* 28:1959-1969
- Chan BCL, Yu H, Wong CW et al (2012) Quick identification of kuraridin, a noncytotoxic anti-MRSA (methicillin-resistant *Staphylococcus aureus*) agent from *Sophora flavescens* using high-speed counter-current chromatography. *J Chromatogr B* 880:157-162
- Chedier LM, Ribeiro de Paiva S, Mazzei da Costa JL et al (1999) Comparative methodology for isolation of flavonoid glycosides from *Clusia criuva* Cambess. *J High Res Chromatogr* 22:527-530
- Chen C, Zhao XH, Yue HL et al. (2014f) Separation of phenylpropanoid glycosides from a Chinese herb by HSCCC. *J Chromatogr Sci* 52:395-399
- Chen D, Fan J, Wang P et al (2012a) Isolation, identification and antioxidative capacity of water-soluble phenylpropanoid compounds from *Rhodiola crenulata*. *Food Chem* 134:2126-2133
- Chen F, Lu HT, Jiang Y (2004) Purification of paeoniflorin from *Paeonia lactiflora* Pall. by high speed counter current chromatography. *J Chromatogr A* 1040:205-208
- Chen F, Li HB, Wong R et al (2005a) Isolation and purification of the bioactive carotenoid zeaxanthin from the microalga *Microcystis aeruginosa* by high-speed counter-current chromatography. *J Chromatogr A* 1064:183-186
- Chen F, Luo J, Kong L (2012c) Fast isolation of ginsenosides Re and Rg1 from the roots of *Panax ginseng* by HSCCC-ELSD combined with MCI gel CC guided by HPLC-MS. *J Liq Chromatogr & Rel Technol* 35: 912-923
- Chen HY, Ye XL, Cui XL et al (2012e) Cytotoxicity and antihyperglycemic effect of minor constituents from *Rhizoma Coptis* in HepG2 cells. *Fitoterapia* 83:67-73
- Chen J, Wang F, Lee FSC et al (2006a) Separation and identification of water-soluble salvianolic acids from *Salvia miltiorrhiza* Bunge by high-speed counter-current chromatography and ESI-MS analysis. *Talanta* 69:172-179
- Chen L, Han Y, Yang F et al (2001) High-speed counter-current chromatography separation and purification of resveratrol and piceid from *Polygonum cuspidatum*. *J Chromatogr A* 907:343-346
- Chen L, Deng L, Chen P (2006b) Separation of isomeric compounds by high speed countercurrent chromatography. *Chin J Chromatogr* 24:570-573
- Chen L, Xin X, Lan R et al. (2014b) Isolation of cyanidin 3-glucoside from blue honeysuckle fruits by high-speed counter-current chromatography. *Food Chem* 52:386-390
- Chen L, Zhang Q, Yang G et al (2007) Rapid purification and scale-up of honokiol and magnolol using high-capacity high-speed counter-current chromatography. *J Chromatogr A* 1142:115-122
- Chen LG, Wang CC (2009) Preparative separation of oligostilbenes from *Vitis thunbergii* var. *taiwaniana* by centrifugal partition chromatography followed by Sephadex LH-20 column chromatography. *Sep Purif Technol* 66:65-70

- Chen LJ, Games DE, Jones J (2003a) Isolation and identification of four flavanoid constituents from the seeds of *Oroxylum indicum* by high speed counter current chromatography. *J Chromatogr A* 988:95-105
- Chen LJ, Games DE, Jones J et al (2003b) Separation and identification of flavonoids in an extract from the seeds of *Oroxylum indicum* by CCC. *J Liq Chromatogr & Rel Technol* 26:1623-1636
- Chen LJ, Song H, Lan XQ et al (2005b) Comparison of high-speed counter-current chromatography instruments for the separation of the extracts of the seeds of *Oroxylum indicum*. *J Chromatogr A* 1063:241-245
- Chen M, Liu L, Chen X (2014e) Preparative isolation and analysis of alcohol dehydrogenase inhibitors from *Glycyrrhiza uralensis* root using ultrafiltration combined with high-performance liquid chromatography and high-speed countercurrent chromatography. *J Sep Sci* 37:1546-1551
- Chen P, Tan Y, Sun D et al (2003c) A novel long chain acyl derivative of epigallocatechin-3-O-gallate prepared and purified from green tea polyphenols. *J Zhejiang Univ Sci* 4:714-718
- Chen P, Wang H, Du Q et al (2002) Purification of long chain fatty acid ester of epigallocatechin-3-O-gallate by high speed counter current chromatography. *J Chromatogr A*, 983:163-165
- Chen P, Wu D, Pan Y (2013) Separation and purification of antioxidants from *Ampelopsis heterophylla* by counter-current chromatography. *J Sep Sci* 36:3660-3666
- Chen Q, Hu X, Li J et al (2011c) Preparative isolation and purification of cuminaldehyde and p-menta-1,4-dien-7-al from the essential oil of *Cuminum cyminum* L. by high-speed counter-current chromatography. *Anal Chim Acta* 689:149-154
- Chen Q, Luo X, Ma X et al (2011b) Fatty acid synthase inhibitors separated from *Oiltea camellia* by high-speed counter-current chromatography. *J Food Sci* 76:750-754
- Chen Q, Yao S, Huang X et al (2009a) Supercritical fluid extraction of *Coriandrum sativum* and subsequent separation of isocoumarins by high-speed counter-current chromatography. *Food Chem* 117:504-508
- Chen QB, Xin XL, Yang Y et al. (2014g) Highly conjugated norditerpenoid and pyrroloquinoline alkaloids with potent ptp1b inhibitory activity from *Nigella glandulifera*. *J Nat Prod* 77:807-812
- Chen QH, Fu ML, Chen MM et al (2012b) Preparative isolation and purification of xanthohumol from hops (*Humulus lupulus* L.) by high-speed counter-current chromatography. *Food Chem* 132:619-623
- Chen T, Wang P, Du Y et al (2012d) Preparative isolation and purification of lutoarin and saponarin from barley seedlings by HSCCC. *J Liq Chromatogr & Rel Technol* 35:2524-2532
- Chen T, Liu Y, Zou D et al. (2014d) Application of an efficient strategy based on liquid-liquid extraction, high-speed counter-current chromatography, and preparative HPLC for the rapid enrichment, separation, and purification of four anthraquinones from *Rheum tanguticum*. *J Sep Sci* 37:165-170
- Chen T, Liu YL, Chen C et al. (2014c) Application of high-speed counter-current chromatography combined with macroporous resin for rapid enrichment and separation of three anthraquinone glycosides and one stilbene glycoside from *Rheum tanguticum*. *J Chromatogr B* 957:90-95
- Chen Z, Wu J, Shen W et al (2011a) Counter-current chromatographic method for preparative scale isolation of picosides from traditional Chinese medicine *Picrorhiza scrophulariiflora*. *J Sep Sci* 34:1910-1916
- Chen Z, Wu JB, Zhang J et al (2009b) One step purification of piperine directly from *Piper nigrum* L. by high performance centrifugal partition chromatography. *Sep Sci Technol* 44:1884-1893
- Chen, X., Feng, Z., Huang et al. (2014a) Effective on-line combination of high shear technique and continuous sample injection in high-performance counter-current chromatography for isolation and purification of polyphenols in green tea. *J Liq Chromatogr & Rel Technol* 37:2571-2586
- Cheng CR, Li YF, Xu PP (2012) Preparative isolation of triterpenoids from *Ganoderma lucidum* by counter-current chromatography combined with pH-zone-refining. *Food Chem* 130:1010-1016
- Cheng Y, Liang Q, Hu P et al (2010) Combination of normal-phase medium-pressure liquid chromatography and high-performance counter-current chromatography for preparation of ginsenoside-Ro from *Panax ginseng* with high recovery and efficiency. *Sep Purif Technol* 73:397-402
- Cheng Y, Zhang M, Liang Q et al. (2011) Two-step preparation of ginsenoside-Re, Rb1, Rc and Rb2 from the root of *Panax ginseng* by high-performance counter-current chromatography. *Sep Purif Technol* 77:347-354
- Cheong JH, Kim CY, Kim J (2007) Preparative isolation and purification of sinomenine from *Sinomenium acutum* by centrifugal partition chromatography. *J Sep Sci* 30:2105-2108
- Chin YW, Jones WP, Waybright TJ et al (2006) Tropane aromatic ester alkaloids obtained from a large-scale recollection of *Erythroxylum pervillei* stem bark collected in Madagascar. *J Nat Prod* 69:414-417
- Chiou FY, Kan P, Chu IM et al (1997) Separation of taxol and cephalomannine by countercurrent chromatography. *J Liq Chromatogr & Rel Technol* 20:57-61
- Choi SJ, Lee MY, Jo H et al (2012) Preparative isolation and purification of neuroprotective compounds from *Rhus verniciflua* by high speed counter-current chromatography. *Biol Pharm Bull* 35:559-567
- Chu X, Sun A, Liu R (2005) Preparative isolation and purification of five compounds from the Chinese medicinal herb *Polygonum cuspidatum* Sieb. et Zucc by high-speed counter-current chromatography. *J Chromatogr A* 1097: 33-39
- Cicek SS, Schwaiger S, Ellmerer EP et al (2010) Development of a fast and convenient method for the isolation of triterpene saponins from *Actaea racemosa* by high-speed countercurrent chromatography coupled with evaporative light scattering detection. *Planta Med* 76:467-473
- Conway WD, Ito Y (1984) Evaluation of nonaqueous solvent systems for countercurrent chromatography using an HPLC assay to determine partition coefficients of a mixture of compounds. *J Liq Chromatogr* 7:291-302

- Cooper RA, Bowers RJ, Beckham CJ et al (1996) Preparative separation of pyrrolizidine alkaloids by high-speed counter-current chromatography. *J Chromatogr A* 732:43-50
- Costa FDN, Garrard I, Da Silva AJR et al (2013) Changes in the mobile phase composition on a stepwise counter-current chromatography elution for the isolation of flavonoids from *Siparuna glycyarpa*. *J Sep Sci* 36:2253-2259
- Cui HY, Jia XY, Zhang X et al (2011) Optimization of high-speed counter-current chromatography for separation of polyphenols from the extract of hawthorn (*Crataegus laevigata*) with response surface methodology. *Sep Purif Technol* 77:269-274
- Da Silva MA, Oliveira APS, Sannomiya M et al (2007) Flavonoids and a naphthopyranone from *Eriocaulon ligulatum* and their mutagenic activity. *Chem Pharm Bull* 55:1635-163
- Da Silva MCA, Heringer AP, Figueiredo MR et al (2012) Separation of clusianone from *Clusia fluminensis* Planch. & Triana (Clusiaceae) by high speed counter-current chromatography (HSCCC). *J Liq Chromatogr & Rel Technol* 35:2313-2321
- da Silva VP, Oliveira RR, Figueiredo MR (2009) Isolation of limonoids from seeds of *Carapa guianensis* Aublet (Meliaceae) by high-speed countercurrent chromatography. *Phytochem Anal* 20:77-81
- Dai X, Hu R, Sun C et al (2012) Comprehensive separation and analysis of alkaloids from *Stephania yunnanensis* by counter-current chromatography coupled with liquid chromatography tandem mass spectrometry analysis. *J Chromatogr A* 1226:18-23
- Dai X, Huang Q, Zhou B et al (2013) Preparative isolation and purification of seven main antioxidants from *Eucommia ulmoides* Oliv. (Du-zhong) leaves using HSCCC guided by DPPH-HPLC experiment. *Food Chem* 139:563-570
- Dalsgaard PW, Potterat O, Dieterle F et al (2006) Noniosides E-H, new trisaccharide fatty acid esters from the fruit of *Morinda citrifolia* (Noni). *Planta Med* 72:1322-1327
- Dang YY, Li XC, Zhang QW et al (2010) Preparative isolation and purification of six volatile compounds from essential oil of *Curcuma wenyujin* using high-performance centrifugal partition chromatography. *J Sep Sci* 33:1658-1664
- de Beer D, Jerz G, Joubert E et al (2009) Isolation of isomangiferin from honeybush (*Cyclopia subternata*) using high-speed counter-current chromatography and high-performance liquid chromatography. *J Chromatogr A* 1216:4282-4289
- de Beer D, Joubert E, Malherbe CJ et al (2011) Use of countercurrent chromatography during isolation of 6-hydroxyluteolin-7- α - β -glucoside, a major antioxidant of *Athrixia phyllicoides*. *J Chromatogr A* 1218:6179-6186
- De Oliveira RR, Heringer AP, Figueiredo MR et al (2006) Isolation of neolignans from *Ocotea elegans* by CCC. *J Liq Chromatogr & Rel Technol* 29:229-234
- de Paiva SR, Figueiredo MR, Kaplan MAC (2005) Isolation of secondary metabolites from roots of *Plumbago auriculata* Lam. by countercurrent chromatography. *Phytochem Anal* 16:278-281
- De Souza Moreira CP, De Oliveira DM, Dos Santos CN et al. (2014) Platypodiol a novel clerodane diterpene from *Baccharis platypod*. *Tetrahedr Lett* 35:4898-4900
- De Souza PA, Rangel LP, Oigman SS et al (2010) Isolation of two bioactive diterpenic acids from *Copaifera glycyarpa* oleoresin by high-speed counter-current chromatography. *Phytochem Anal* 21:539-543
- Degenhardt A, Habben S, Winterhalter P (2002) Isolation of the lignan secoisolariciresinol diglucoside from flaxseed (*Linum usitatissimum* L.) by high speed countercurrent chromatography. *J Chromatogr A* 943:299-302
- Degenhardt A, Engelhardt UH, Lakenbrink C et al (2000c) Preparative separation of polyphenols from tea by high-speed countercurrent chromatography. *J Agric Food Chem* 48:3425-3430
- Degenhardt A, Engelhardt UH, Wendt AS et al (2000a) Isolation of black tea pigments using high-speed countercurrent chromatography and studies on properties of black tea polymers. *J Agric Food Chem* 48:5200-5205
- Degenhardt A, Hofmann S, Knapp H et al (2000d) Preparative isolation of anthocyanins by high-speed countercurrent chromatography and application of the color activity concept to red wine. *J Agric Food Chem* 48:5812-5818
- Degenhardt A, Knapp H, Winterhalter P (2000b) Separation and purification of anthocyanins by high-speed countercurrent chromatography and screening for antioxidant activity. *J Agric Food Chem* 48:338-343
- Degenhardt A, Knapp H, Winterhalter P (2000e) Rapid isolation of malvidin-3-glucoside from red wine by high speed counter current chromatography. *Vitis* 39:43-44
- Degenhardt A, Winterhalter P (2001) Isolation and purification of isoflavones from soy flour by high-speed countercurrent chromatography. *Eur Food Res & Technol* 213:277-280
- Delaunay JC, Castagnino C, Cheze C et al (2002) Preparative isolation of polyphenolic compounds from *Vitis vinifera* by centrifugal partition chromatography. *J Chromatogr A* 964:123-128
- Deng J, Xiao X, Li G et al (2009a) Application of microwave-assisted extraction coupled with high-speed counter-current chromatography for separation and purification of dehydrocavidine from *Corydalis saxicola* Bunting. *Phytochem Anal* 20:498-502
- Deng S, Deng Z, Fan Y et al (2009b) Isolation and purification of three flavonoid glycosides from the leaves of *Nelumbo nucifera* (Lotus) by high-speed counter-current chromatography. *J Chromatogr B* 877:2487-2492
- Destandau E, Toribio A, Lafosse M et al (2009) Centrifugal partition chromatography directly interfaced with mass spectrometry for the fast screening and fractionation of major xanthenes in *Garcinia mangostana*. *J Chromatogr A* 1216:1390-1394
- Devia B, Llabres G, Wouters J et al. (2002) New 3-deoxyanthocyanidins from leaves of *Arrabidaea chica*. *Phytochem Anal* 13:114-120

- Diallo B, Vanhaelen Fastre R, Vanhaelen M (1991) Direct coupling of high speed counter current chromatography to thin layer chromatography. Application to the separation of asiaticoside and madecassoside from *Centella asiatica*. J Chromatogr 558:446-450
- Diallo B, Vanhaelen M (1988) Large scale purification of apocarotenoids from *Cocleospermum tinctorium* by counter-current chromatography. J Liq Chromatogr 11:227-231
- Dong H, Zhang Y, Fang L (2011) Combinative application of pH-zone-refining and conventional high-speed counter-current chromatography for preparative separation of alkaloids from *Stephania kwangsiensis*. J Chromatogr B 879:945-949
- dos Santos BCB, da Silva JCT, Guerrero Jr. PG et al (2009) Isolation of chavibetol from essential oil of *Pimenta pseudocaryophyllus* leaf by high-speed counter-current chromatography. J Chromatogr A 1216:4303-4306
- Du D, Zhu F, Chen X et al (2011) Rapid isolation and purification of inotodiol and trametenolic acid from *Inonotus obliquus* by high-speed counter-current chromatography with evaporative light scattering detection. Phytochem Anal 22: 419-423
- Du Q, Xiong X, Ito Y (1995a) Separation of bioactive quadri-terpenic acids from the fruit of *Ligustrum lucidum* Ait by high-speed countercurrent chromatography. J Liq Chromatogr 18:1997-2004
- Du Q, Cai W, Xia M et al (2002b) Purification of (+) dihydromyricetin from leaves extract of *Ampelopsis grossedentata* using high speed countercurrent chromatograph with scale up triple columns. J Chromatogr A 973:217-220
- Du Q, Cai WJ, Ito Y (2002c) Preparative separation of fruit extract of *Silybim marianum* using a high speed countercurrent chromatograph with scale up columns. J Liq Chromatogr & Rel Technol 26:2515-2520
- Du Q, Chen H (2010) The methoxyflavones in *Citrus reticulata Blanco cv. ponkan* and their antiproliferative activity against cancer cells. Food Chem 119:567-572
- Du Q, Chen P, Jerz G et al (2004a) Preparative separation of flavanoid glycosides in leaves extract of *Ampelopsis grossedentata* using high speed counter current chromatography. J Chromatogr A 1040:147-149
- Du Q, Daijie W, Ito Y (2006) Preparation of solanesol from a tobacco leaf extract using high speed countercurrent chromatography. J Liq Chromatogr & Rel Technol 29:2587-2592
- Du Q, Fang J, Gao S et al (2008b) A gram-scale separation of glucosinolates from an oil-pressed residue of rapeseeds using slow rotary countercurrent chromatography. Sep Purif Technol 59:294-298
- Du Q, Gao S (2006) Preparative separation of saponins from the *Luffa cylindrica* (L.) Roem. by slow rotary countercurrent chromatography. J Liq Chromatogr & Rel Technol 29:2451-2456
- Du Q, Jerz G, Chen P et al (2004c) Preparation of ursane triterpenoids from *Centella asiatica* using high speed countercurrent chromatography with step-gradient elution. J Liq Chromatogr & Rel Technol 27:2201-2215
- Du Q, Jerz G, Waibel R et al (2003b) Isolation of dammarane saponins from *Panax notoginseng* by high speed counter current chromatography. J Chromatogr A 1008:173-180
- Du Q, Jerz G, Winterhalter P (2003a) Separation of andrographolide and neoandrographolide from the leaves of *Andrographis paniculata* using high speed counter current chromatography. J Chromatogr A 984:147-151
- Du Q, Jerz G, Winterhalter P (2004b) Isolation of two anthocyanin sambubiosides from bilberry (*Vaccinium myrtillus*) by high speed counter current chromatography. J Chromatogr A 1045:59-63
- Du Q, Jerz G, Winterhalter P (2004d) Preparation of three flavonoids from the bark of *Salix alba* by high speed countercurrent chromatography separation. J Liq Chromatogr & Rel Technol 27:3257-3264
- Du Q, Jiang Z, Wang D (2009) Excellent combination of counter-current chromatography and preparative high-performance liquid chromatography to separate galactolipids from pumpkin. J Chromatogr A 1216:4176-4180
- Du Q, Li L, Jerz G (2005) Purification of astilbin and isoastilbin in the extract of *Smilax glabra* rhizome by high-speed counter-current chromatography. J Chromatogr A 1077:98-101
- Du Q, Li Z, Ito Y (2001a) Preparative separation of isoflavone components in soybeans using high-speed counter-current chromatography. J Chromatogr A 923:271-274
- Du Q, Wang K (2007) Preparative separation of phenolic constituents in the fruits of *Luffa cylindrica* (L.) Roem using slow rotary countercurrent chromatography. J Liq Chromatogr & Rel Technol 30:1915-1922
- Du Q, Wang X (2008) Industrial preparation of cyanidin-3-glucoside from the fruits of *Myrica rubra* using slow rotary countercurrent chromatography. Int J Appl Res Nat Prod 1:1-5
- Du Q, Xia M, Ito Y (2002a) Purification of icariin from the extract of *Epimedium segittatum* using high speed counter current chromatography. J Chromatogr A 962:239-241
- Du Q, Zheng J, Xu Y (2008a) Composition of anthocyanins in mulberry and their antioxidant activity. J Food Comp Anal 21:390-395
- Du QZ, Jiang HY, Ito Y (2001b) Separation of theaflavins of black tea. High-speed countercurrent chromatography vs sephadex LH-20 (gel column) chromatography. J Liq Chromatogr & Rel Technol 24:2363-2369
- Du QZ, Ke CQ, Ito Y (1998) Recycling high-speed countercurrent chromatography for separation of taxol and cephalomannine. J Liq Chromatogr & Rel Technol 21:157-162
- Duan W, Tan S, Chen J et al (2013) Isolation of anti-HIV components from *Canarium album* fruits by high-speed counter-current chromatography. Anal Lett 46:1057-1068
- Duan W, Bai A, Lin X et al. (2014) Isolation and purification of highly polar antioxidants from *Chirita longgangensis* by combination of macroporous resin and HSCCC. Chromatographia 77:707-713
- Duret P, Waechter AI, Margraff R et al (1997) High-speed countercurrent chromatography: a promising method for the separation of the *Annonaceae* acetogenins. J Liq Chromatogr & Rel Technol 20:627-635

- Duret P, Fakhfakh MA, Herrenknecht C et al (2003) Preparative separation of quinolines by centrifugal partition chromatography with gradient elution. *J Chromatogr A* 1011:55-65
- Engelberth AS, Carrier DJ, Clausen EC (2008) Separation of silymarins from milk thistle (*Silybum marianum* L.) extracted with pressurized hot water using fast centrifugal partition chromatography. *J Liq Chromatogr & Rel Technol* 31:3001-3011
- Engelberth AS, Clausen EC, Carrier DJ (2010) Comparing extraction methods to recover ginseng saponins from American ginseng (*Panax quinquefolium*), followed by purification using fast centrifugal partition chromatography with HPLC verification. *Sep Purif Technol* 72:1-6
- Engels C, Gänzle MG, Schieber A (2010) Fractionation of gallotannins from mango (*Mangifera indica* L.) kernels by high-speed counter-current chromatography and determination of their antibacterial activity. *J Agric Food Chem* 58:775-780
- Fahey JW, Wade KL, Stephenson KK et al (2003) Separation and purification of glucosinolates from crude plant homogenates by high speed counter current chromatography. *J Chromatogr A* 996:85-93
- Fan JP, He CH (2006) Single-step preparative separation of barbinervic acid and its epimer (rotungenic acid), along with two other pentacyclic triterpene acids from the leaves of *Diospyros kaki* using HSCCC. *J Liq Chromatogr & Rel Technol* 29:815-826
- Fan P, Hay AE, Marston A et al (2008) Acetylcholinesterase-inhibitory activity of linarin from *Buddleja davidii*, structure-activity relationships of related flavonoids, and chemical investigation of *Buddleja nitida*. *Pharm Biol* 46:596-601
- Fan P, Marston A, Hay AE et al (2009) Rapid separation of three glucosylated resveratrol analogues from the invasive plant *Polygonum cuspidatum* by high-speed countercurrent chromatography. *J Sep Sci* 32:2979-2984
- Fan Y, Duan W, Luo Y et al. (2014) Preparative separation and purification of two flavanols from *Smilax china* L. using high-speed counter-current chromatography. *Eur Food Res Technol* 240:33-39
- Fang L, Liu Y, Zhuang H et al (2011) Combined microwave-assisted extraction and high-speed counter-current chromatography for separation and purification of xanthenes from *Garcinia mangostana*. *J Chromatogr B* 879:3023-3027
- Fang L, Zhou J, Lin Y et al (2013) Large-scale separation of alkaloids from *Gelsemium elegans* by pH-zone-refining counter-current chromatography with a new solvent system screening method. *J Chromatogr A* 1307:80-85
- Farthing JE, O'Neill MJ (1990) Isolation of gingerols from powdered root ginger by countercurrent chromatography. *J Liq Chromatogr* 13:941-950
- Feng L, Ji H, Gu H et al (2009) An efficient method for extraction, separation and purification of naphthoquinone pigments from *Lithospermum erythrorhizon* Sieb. et Zucc. by SFE and HSCCC. *Chromatographia* 70:1197-1200
- Feng S, Ni S, Sun W (2007) Preparative isolation and purification of the lignan pinoselin diglucoside and liriodendrin from the bark of *Eucommia ulmoides* Oliv. by high speed countercurrent chromatography. *J Liq Chromatogr & Rel Technol* 30:135-145
- Feng ZF, Chen XF, Zhang J et al (2013) Activity-screening-guided isolation and purification for vasodilative effects compounds from *Radix Astragali* by high-speed counter-current chromatography using gradient elution. *Nat Prod Res* 27:1020-1022
- Feng ZF, Chen XF, Di DL (2012) Online extraction and isolation of highly polar chemical constituents from *Brassica napus* L. pollen by high shear technique coupled with high-performance counter-current chromatography. *J Sep Sci* 35:625-632
- Fischedick JT, Pesic M, Podolski-Renic A et al. (2013a) Cytotoxic activity of sesquiterpene lactones from *Inula britannica* on human cancer cell lines. *Phytochem Lett* 6:246-252
- Fischedick JT, Standiford M, Johnson DA et al (2012) Activation of antioxidant response element in mouse primary cortical cultures with sesquiterpene lactones isolated from *Tanacetum parthenium*. *Planta Med* 78:1725-1730
- Fischedick JT, Standiford M, Johnson DA et al (2013b) Structure activity relationship of phenolic diterpenes from *Salvia officinalis* as activators of the nuclear factor E2-related factor 2 pathway. *Bioorg Med Chem* 21:2618-2622
- Fischer N, Weinreich B, Nitz S et al (1991) Applications of high speed counter current chromatography for the separation and isolation of natural products. *J Chromatogr* 538:193-202
- Foucault AP (1991) Countercurrent chromatography. *Anal Chem* 63:569A-579A
- Frighetto N, Welendorf RM, Pereira da Silva AM et al (2005) Purification of betulinic acid from *Eugenia florida* (Myrtaceae) by high-speed counter-current chromatography. *Phytochem Anal* 16:411-414
- Frighetto RTS, Welendorf RM, Nigro EN et al (2008) Isolation of ursolic acid from apple peels by high speed counter-current chromatography. *Food Chem* 106:767-771
- Fu Y, Li Z, Si J et al (2013) Separation and purification of myricitrin from bayberry tree bark by high-speed counter-current chromatography. *J Liq Chromatogr & Rel Technol* 36:1503-1512
- Fukuhara K, Kubo I (1991) Isolation of steroidal glycoalkaloids from *Solanum incanum* by two countercurrent chromatographic methods. *Phytochemistry* 30:685-687
- Fullas F, Choi YH, Kinghorn D et al (1990) Sweet-tasting triterpene glycoside constituents of *Abrus fruticulosus*. *Planta Med* 56:332-333
- Gao M, Gu M, Liu C (2006) Two-step purification of scutellarin from *Erigeron breviscapus* (vant.) Hand. Mazz. by high-speed counter-current chromatography. *J Chromatogr B* 838:139-143

- Geng Y, Liu J, Lv R et al (2007) An efficient method for extraction, separation and purification of eugenol from *Eugenia caryophyllata* by supercritical fluid extraction and high-speed counter-current chromatography. *Sep Purif Technol* 57:237-241
- Goll J, Frey A, Minceva M (2013) Study of the separation limits of continuous solid support free liquid-liquid chromatography: separation of capsaicin and dihydrocapsaicin by centrifugal partition chromatography. *J Chromatogr A* 1284:59-68
- Gonçalves MS, Curcino Vieira IJ, Oliveira RR et al (2011) Application of preparative high-speed counter-current chromatography for the separation of two alkaloids from the roots of *Tabernaemontana catharinensis* (Apocynaceae). *Molecules* 16:7480-7487
- Gosse BK, Gnabre JN, Ito Y et al (2002) Isolation of saponins with viral entry inhibitory activity by combined chromatographic methods. *J Liq Chromatogr & Rel Technol* 25:3199-3211
- Grace MH, Warlick CW, Neff SA et al. (2014) Efficient preparative isolation and identification of walnut bioactive components using high-speed counter-current chromatography and LC-ESI-IT-TOF-MS. *Food Chem* 158:229-238
- Grancher D, Jaussaud P, Durix A et al (2004) Countercurrent chromatographic isolation of lolitrem B from endophyte infected ryegrass (*Lolium perenne* L) seed. *J Chromatogr A* 159:73-81
- Graziose R, Rathinasabapathy T, Lategan C et al (2011) Antiplasmodial activity of aporphine alkaloids and sesquiterpene lactones from *Liriodendron tulipifera* L. *J Ethnopharmacol* 133:26-30
- Gu DY, Yang Y, Zhong J et al (2007b) High-speed counter-current chromatography combined with column chromatography for isolation of methyllycaconitine from *Delphinium pseudocyanthum*. *Chromatographia* 66:949-951
- Gu J, Feng R, Wu Z, et al (2013) A rapid and convenient method for preparative separation of three indissoluble polyphenols from *Euphorbia pekinensis* by the flexible application of solvent extraction combined with counter-current chromatography. *J Sep Sci* 36:2366-2372
- Gu M, Zhang G, Su Z et al. (2004) Identification of major active constituents in the fingerprint of *Salvia miltiorrhiza* Bunge developed by high speed counter current chromatography. *J Chromatogr A* 1041:239-243
- Gu M, Su Z, Ouyang F (2006) Fingerprinting of *Salvia miltiorrhiza* Bunge by thin-layer chromatography scan compared with high speed countercurrent chromatography. *J Liq Chromatogr & Rel Technol* 29:1503-1514
- Gu M, Wang X, Su Z et al. (2007a) One-step separation and purification of 3,4-dihydroxyphenyllactic acid, salvianolic acid B and protocatechualdehyde from *Salvia miltiorrhiza* Bunge by high-speed counter-current chromatography. *J Chromatogr A* 1140:107-111
- Guebailia H, Chira K, Richard T et al (2006) Hopeaphenol: The first resveratrol tetramer in wines from North Africa. *J Agric Food Chem* 54:9559-9564
- Gui Y, Tsao R, Li L et al (2011) Preparative separation of chromones in plant extract of *Saposhnikovia divaricata* by high-performance counter-current chromatography. *J Sep Sci* 34:520-526
- Guimarães HA, Vieira IJC, Braz-Filho R et al (2013) Two novel plumeran indole alkaloids isolated from *Aspidosperma cylindrocarpon* (Apocynaceae). *Helvet Chim Acta* 96:1793-1800
- Guo S, Feng B, Zhu R et al (2011) Preparative isolation of three anthraquinones from *Rumex japonicus* by high-speed counter-current chromatography. *Molecules* 16:1201-1210
- Guo X, Wang D, Duan W et al (2010) Preparative isolation and purification of four flavonoids from the petals of *Nelumbo nucifera* by high-speed counter-current chromatography. *Phytochem Anal* 21:268-272
- Gutiérrez F, Estévez-Braun A, Ravelo AG et al (2007) Terpenoids from the medicinal plant *Maytenus ilicifolia*. *J Nat Prod* 70:1049-1052
- Gutzeit D, Wray V, Winterhalter P et al (2007) Preparative isolation and purification of flavonoids and protocatechuic acid from sea buckthorn juice concentrate (*Hippophaë rhamnoides* L. ssp. *rhamnoides*) by high-speed counter-current chromatography. *Chromatographia* 65:1-7
- Ha IJ, Kang M, Na YC et al (2011) Preparative separation of minor saponins from *Platycodi Radix* by high-speed counter-current chromatography. *J Sep Sci* 34:2559-2565
- Ha YW, Kim YS (2009) Preparative isolation of six major saponins from *Platycodi radix* by high-speed counter-current chromatography. *Phytochem Anal* 20:207-213
- Ha YW, Lim SS, Ha IJ et al (2007) Preparative isolation of four ginsenosides from Korean red ginseng (steam-treated *Panax ginseng* C. A. Meyer), by high-speed counter-current chromatography coupled with evaporative light scattering detection. *J Chromatogr A* 1151:37-44
- Han C, Xu J, Wang X et al. (2014a) Enantioseparation of racemic trans- δ -viniferin using high speed counter-current chromatography based on induced circular dichroism technology. *J Chromatogr A* 1324:164-170
- Han L, Boakye-Yiadom M, Zhang Y et al. (2014b) Separation and purification of two isomeric saponins from *Albizia* cortex by high-speed counter-current chromatography and preparative high-performance liquid chromatography. *Sep Sci Technol* 49:594-600
- Han L, Ji L, Boakye-Yiadom M et al (2012) Preparative isolation and purification of four compounds from *Cistanches deserticola* Y.C. Ma by high-speed counter-current chromatography. *Molecules* 17: 8276-8284
- Han Q, Song J, Qiao C et al (2006b) Preparative isolation of hydrolysable tannins chebulagic acid and chebulinic acid from *Terminalia chebula* by high-speed counter-current chromatography. *J Sep Sci* 29:1653-1657
- Han QB, Song JZ, Qiao CF et al (2006a) Preparative separation of gambogic acid and its C-2 epimer using recycling high-speed counter-current chromatography. *J Chromatogr A* 1127:298-301

- Han QB, Tang WL, Dong CX et al (2013) An interesting two-phase solvent system and its use in preparative isolation of aconitines from *Aconite* roots by counter-current chromatography. *J Sep Sci* 36:1304-1310
- Han QB, Wong L, Lai F et al. (2009b) Preparative isolation of pseudolaric acids A and B and their glucosides from the root bark of *Pseudolarix kaempferi* using high-speed countercurrent chromatography. *J Sep Sci* 32:309-313
- Han QB, Wong L, Yang NY et al (2008b) A simple method to optimize the HSCCC two-phase solvent system by predicting the partition coefficient for target compound. *J Sep Sci* 31:1189-1194
- Han QB, Zhou Y, Feng C et al (2009a) Bioassay guided discovery of apoptosis inducers from gamboge by high-speed counter-current chromatography and high-pressure liquid chromatography/electrospray ionization quadrupole time-of-flight mass spectrometry. *J Chromatogr B* 877:401-407
- Han QB, Song JZ, Qiao CF et al (2007b) Preparation isolation of cyclolanostane-type saponins from *Astragalus membranaceus* Bge. var. *mongholicus* (Bge.) Hsiao by TLC-MS/MS guided high-speed counter-current chromatography. *J Sep Sci* 30:135-140
- Han X, Pathmasiri W, Bohlin L et al. (2004) 1-[2',4'-dihydroxy-3',5'-di-(3"-methylbut-2"-enyl)-6'-methoxy]phenylethanone from *Acronychia pedunculata* (L) Miq. by high speed counter current chromatography. *J Chromatogr A* 1022:213-216
- Han X, Zhang T, Ito Y (2003) Separation of high purity przewaquinone A by high speed countercurrent chromatography. *J Liq Chromatogr & Rel Technol* 26:1267-1274
- Han X, Zhang T, Wei Y et al (2002) Separation of salidroside from *Rhodiola crenulata* by high speed counter current chromatography. *J Chromatogr A* 971:237-241
- Han X, Ma X, Zhang T et al (2007a) Isolation of high-purity casticin from *Artemisia annua* L. by high-speed counter-current chromatography. *J Chromatogr A* 1151:180-182
- Han X, Zheng L, Qiu Z et al (2008a) Efficient protocol for large-scale purification of naringin with high recovery from *Fructus aurantii* by macroporous resin column chromatography and HSCCC. *Chromatographia* 68:319-326
- Hazekamp A, Simons R, Peltenburg Looman A et al (2004) Preparative isolation of cannabinoids from *Cannabis sativa* by centrifugal partition chromatography. *J Liq Chromatogr & Rel Technol* 27:2421-2439
- Hazekamp A, Verpoorte R, Panthong A (2001) Isolation of a bronchodilator flavenoid from the Thai medicinal plant *Clerodendrum petasites*. *J Ethnopharmacol* 78:45-49
- He D, Gu D, Huang Y et al (2009a) Separation and purification of phenolic acids and myricetin from black currant by high-speed countercurrent chromatography. *J Liq Chromatogr & Rel Technol* 32:3077-3088
- He D, Huang Y, Ayupbek A et al (2010) Separation and purification of flavonoids from black currant leaves by high-speed countercurrent chromatography and preparative HPLC. *J Liq Chromatogr & Rel Technol* 33:615-628
- He F, Bai Y, Wang J et al (2011a) Isolation and purification of oridonin from the whole plant of *Isodon rubescens* by high-speed counter-current chromatography. *Molecules* 16:7949-7957
- He K, Ye X, Li X et al (2012b) Separation of two constituents from purple sweet potato by combination of silica gel column and high-speed counter-current chromatography. *J Chromatogr B* 881-882:49-54
- He S, Lu Y, Jiang L et al (2009b) Preparative isolation and purification of antioxidative stilbene oligomers from *Vitis chunganensis* using high-speed counter-current chromatography in stepwise elution mode. *J Sep Sci* 32:2339-2345
- He S, Li S, Yang J et al (2012a) Application of step-wise gradient high-performance counter-current chromatography for rapid preparative separation and purification of diterpene components from *Pseudolarix kaempferi* Gordon. *J Chromatogr A* 1235:34-38
- He S, Lu Y, Wu B et al (2007) Isolation and purification of antioxidative isomeric polyphenols from the roots of *Parthenocissus laetevirens* by counter-current chromatography. *J Chromatogr A* 1151:175-179
- He W, Van Puyvelde L, Maes L et al (2002) Antitrichomonas in vitro activity of *Cussonia holstii* Engl. *Nat Prod Res* 17:127-133
- He Y, Luo J, Kong L (2011b) Preparative separation of atropine and scopolamine from *Daturae metelis* Flos using pH-zone-refining counter-current chromatography with counter-rotation and dual-mode elution procedure. *J Sep Sci* 34:806-811
- He Y, Lv H, Wang X et al. (2014) Isolation and purification of six bioactive compounds from the seeds of *Trigonella foenum-graecum* L. using high-speed counter-current chromatography. *Sep Sci Technol* 49:580-587
- Hermans-Lokkerbol ACJ, Hoek AC, Verpoorte R (1997) Preparative separation of bitter acids from hop extracts by centrifugal partition chromatography. *J Chromatogr A* 771:71-79
- Hewitson P, Ignatova S, Ye H, Chen L, Sutherland I (2009) Intermittent countercurrent extraction as an alternative approach to purification of Chinese herbal medicines. *J Chromatogr A* 1216:4187-4192
- Hopp DC, Conway WD, McLaughlin JL (1999) Using countercurrent chromatography to assist in the purification of new annonaceous acetogenins from *Annona squamosa*. *Phytochem Anal* 10:339-347
- Hostettmann K, Marston A (2001) Countercurrent chromatography in the preparative separation of plant-derived natural products. *J Liq Chromatogr & Rel Technol* 24:1711-1721
- Hou Z, Luo J, Wang J et al (2010) Separation of minor coumarins from *Peucedanum praeruptorum* using HSCCC and preparative HPLC guided by HPLC/MS. *Sep Purif Technol* 75:132-137
- Hou Z, Xu D, Yao S et al (2009) An application of high-speed counter-current chromatography coupled with electrospray ionization mass spectrometry for separation and online identification of coumarins from *Peucedanum praeruptorum* Dunn. *J Chromatogr B* 877:2571-2578

- Hu J, Liang Y, Xie Y et al (2007) Isolation and purification of solanesol from potato leaves by high-speed counter-current chromatography and identification by atmospheric pressure chemical ionization mass spectrometry. *Chin J Chromatogr* 25:528-531
- Hu JN, Shan B, Deng ZY et al (2010a) Application of high-speed counter-current chromatography for the isolation of 5 alkaloids from lotus (*Nelumbo nucifera* Gaertn.) leaves. *Food Sci Biotechnol* 19:1661-1665
- Hu R, Dai X, Lu Y et al (2010b) Preparative separation of isoquinoline alkaloids from *Stephania yunnanensis* by pH-zone-refining counter-current chromatography. *J Chromatogr B* 878:1881-1884
- Hu Y, Liu C, Cong L et al. (2014) Application of high-performance counter-current chromatography and medium-pressure liquid chromatography for rapid isolation of lactones from *Ligusticum chuanxiong* Hort. *J Liq Chromatogr & Rel Technol* 37:1187-1198
- Huang J, Xu X, Xie C et al (2013) Isolation and purification of paeoniflorin and albiflorin from radix *Paeoniae rubra* by high-speed counter-current chromatography. *J Liq Chromatogr & Rel Technol* 36:419-427
- Huang J, Xu X, Xie Z et al. (2014) Isolation and purification of 20-hydroxyecdysone from radix *Serratulae chinensis* by high-speed counter-current chromatography. *J Liq Chromatogr & Rel Technol* 37:1909-1916
- Huang L, Cao Y, Chen G (2008) Purification of quercetin in *Anoectochilus roxburghii* (Wall) Lindl using UMAE by high-speed counter-current chromatography and subsequent structure identification. *Sep Purif Technol* 64:101-107
- Huang L, Cao Y, Xu H et al (2011) Separation and purification of ergosterol and stigmaterol in *Anoectochilus roxburghii* (wall) Lindl by high-speed counter-current chromatography. *J Sep Sci* 34:385-392
- Huang T, Shen P, Shen Y (2005b) Preparative separation and purification of deoxyschisandrins and γ -schisandrin from *Schisandra chinensis* (Turcz.) Baill by high-speed counter-current chromatography. *J Chromatogr A* 1066:239-242
- Huang T, Shen Y, Shen P (2005a) Preparative separation and purification of schisandrin and schisantherin from *Schisandra Chinensis* (Turcz) Baill by high speed countercurrent chromatography. *J Liq Chromatogr & Rel Technol* 28:2383-2390
- Huang XY, Fu JF, Di DL (2010) Preparative isolation and purification of steviol glycosides from *Stevia rebaudiana* Bertoni using high-speed counter-current chromatography. *Sep Purif Technol* 71:220-224
- Huangfu ZK, Ni SF, Sun WJ (2007) Preparative separation of gentiopicoside from aerial part of *Gentiana macrophylla* pall by high speed counter-current chromatography. *Chin J Anal Chem* 35 :883-886
- Inoue K, Nomura C, Mizuno Y et al (2008b) Separation of major safflowers from *Carthamus yellow* using high-speed countercurrent chromatography. *J Liq Chromatogr & Rel Technol* 31:1047-1059
- Inoue K, Nomura C, Ito S et al (2008a) Purification of curcumin, demethoxycurcumin, and bisdemethoxycurcumin by high-speed countercurrent chromatography. *J Agric Food Chem* 56:9328-9336
- Ito Y, Oka H, Lee YW (1990) Improved high speed counter current chromatograph with three multilayer coils connected in series. II. Separation of various biological samples with a semi preparative column. *J Chromatogr* 498:169-178
- Jeon JS, Kim CY (2013) Preparative separation and purification of flavonoids and stilbenoids from *Parthenocissus tricuspidata* stems by dual-mode centrifugal partition chromatography. *Sep Purif Technol* 105:1-7
- Jeon JS, Kim SM, Lee HJ et al (2012) Preparative isolation and purification of prenylated isoflavonoids from *Cudrania tricuspidata* fruits using centrifugal partition chromatography. *J Liq Chromatogr & Rel Technol* 35:1607-1615
- Jerz G, Skotzki T, Fiege K (2008) Separation of betalains from berries of *Phytolacca americana* by ion-pair high-speed counter-current chromatography. *J Chromatogr A* 1190:63-73
- Jerz G, Wybraniec S, Gebers N et al. (2010) Target-guided separation of *Bougainvillea glabra* betacyanins by direct coupling of preparative ion-pair high-speed countercurrent chromatography and electrospray ionization mass-spectrometry. *J Chromatogr A* 1217:4544-4554
- Jerz G, Elnakady YA, Braun A et al. (2014a) Preparative mass-spectrometry profiling of bioactive metabolites in Saudi-Arabian propolis fractionated by high-speed countercurrent chromatography and off-line atmospheric pressure chemical ionization mass-spectrometry injection. *J Chromatogr A* 1347:17-29
- Jerz G, Gebers N, Szot D et al. (2014b) Separation of amaranthine-type betacyanins by ion-pair high-speed countercurrent chromatography. *J Chromatogr A* 1344:42-50
- Jia J, Chen T, Wang P et al (2012) Preparative separation of methylswerertianin, swerchirin and decussatin from the Tibetan medicinal plant *Swertia mussotii* using high-speed counter-current chromatography. *Phytochem Anal* 23:332-336
- Jiang L, Lu Y, He S et al (2008) Preparative isolation and purification of two amides from *Mallotus lianus* Croiz by high-speed counter-current chromatography. *J Sep Sci* 31:3930-3935
- Jiang X, Shi S, Zhang Y et al (2010a) Excellent combination of HPLC-RSD-DAD-ESI/MS and HSCCC experiments to screen and identify radical scavengers from *Neo-Taraxacum siphonanthum*. *J Brazil Chem Soc* 21:1524-1529
- Jiang X, Shi S, Zhang Y et al (2010b) Activity-guided isolation and purification of three flavonoid glycosides from *Neo-Taraxacum siphonanthum* by high-speed counter-current Chromatography. *Sep Sci Technol* 45:839-843
- Jiang Z, Chen W, Liu S et al (2011) Preparation of crocin from *Gardenia* yellow pigment by slow rotary countercurrent chromatography. *Chin J Chromatogr* 29:277-280
- Jiang Z, Shi R, Zhang H et al. (2014) Separation and purification of antioxidant glycolipids from fruit of *Cucurbita moschata* by high-speed counter-current chromatography coupled with preparative high-performance liquid chromatography. *J Liq Chromatogr & Rel Technol* 37:974-987
- Jikai L, Yue H, Henkel T et al (2002) One step purification of corilagin and ellagic acid from *Phyllanthus urinaria* using high speed countercurrent chromatography. *Phytochem Anal* 13:1-3

- Jin J, Li Y, Kipleting Tanui E et al (2013a) Fishing and knockout of bioactive compounds using a combination of high-speed counter-current chromatography (HSCCC) and preparative HPLC for evaluating the holistic efficacy and interaction of the components of *Herba Epimedii*. *J Ethnopharmacol* 147:357-365
- Jin W, Tu PF (2005) Preparative isolation and purification of trans-3,5,4'-trihydroxystilbene-4'-O- β -D-glucopyranoside and (+)catechin from *Rheum tanguticum* Maxim. ex Balf. using high-speed counter-current chromatography by stepwise elution and stepwise increasing the flow-rate of the mobile phase. *J Chromatogr A* 1092:241-245
- Jin Y, Qian D, Du Q (2013b) Preparation of bioactive amide compounds from black pepper by countercurrent chromatography and preparative HPLC. *Ind Crops Prod* 44:258-262
- Jubert C, Bailey G (2007) Isolation of chlorophylls a and b from spinach by counter-current chromatography. *J Chromatogr A* 1140:95-100
- Jung K, Jeon JS, Ahn MJ et al (2012) Preparative isolation and purification of flavonoids from *Pterocarpus saltalinus* using centrifugal partition chromatography. *J Liq Chromatogr & Rel Technol* 35:2462-2470
- Kaiser N, Birkholz D, Colomban S et al (2013) A new method for the preparative isolation of chlorogenic acid lactones from coffee and model roasts of 5-caffeoylquinic acid. *J Agric Food Chem* 61:6937-6941
- Kamil M, Ahmad F, Jayaraj AF et al (2000) Isolation and identification of a flavonol glycoside using high speed counter current chromatographic technique from the leaves of *Salvadora persica*. *Pakistan J Sci Ind Res* 43:255-257
- Kielbus M, Skalicka-Woźniak K, Grabarska A et al (2013) 7-substituted coumarins inhibit proliferation and migration of laryngeal cancer cells in vitro. *Anticancer Res* 33:4347-4356
- Kim CY, Kim J (2007) Preparative isolation and purification of geniposide from *Gardenia* fruits by centrifugal partition chromatography. *Phytochem Anal* 18:115-117
- Kim CY, Lee HJ, Lee MK et al (2007) One step purification of flavanone glycosides from *Poncirus trifoliata* by centrifugal partition chromatography. *J Sep Sci* 30:2693-2697
- Kim CY, Ahn MJ, Kim J (2006) A preparative isolation and purification of arctigenin and matairesinol from *Forsythia koreana* by centrifugal partition chromatography. *J Sep Sci* 29:656-659
- Kim NC, Oberlies NH, Brine DR et al (2001) Isolation of symlandine from the roots of common comfrey *Symphytum officinale* using countercurrent chromatography. *J Nat Prod* 64:251-253
- Kim SM, Shang YF, Um BH (2010) Preparative separation of chlorogenic acid by centrifugal partition chromatography from highbush blueberry leaves *Vaccinium corymbosum* L.). *Phytochem Anal* 21:457-462
- Kim SM, Shang YF, Um BH (2011) A preparative method for isolation of fucoxanthin from *Eisenia bicyclis* by centrifugal partition chromatography. *Phytochem Anal* 22:322-329
- Knapp H, Straubinger M, Fornari S et al (1998) {S}-3,7-dimethyl-5-octene-1,7-diol and related oxygenated monoterpenoids from petals of *Rosa damascena* Mill. *J Agric Food Chem* 46:1966-1970
- Kuang P, Song D, Yuan Q et al (2013) Preparative separation and purification of sulforaphene from radish seeds by high-speed countercurrent chromatography. *Food Chem* 136:309-315
- Kubo I (1991) Recent applications of counter-current chromatography to the isolation of bioactive natural products. *J Chromatogr* 538:187-191
- Kumar NS, Rajapaksha M (2005) Separation of catechin constituents from five tea cultivars using high-speed counter-current chromatography. *J Chromatogr A* 1083:223-228
- Lechtenberg M, Schepmann D, Niehues M et al (2008) Quality and functionality of saffron: Quality control, species assortment and affinity of extract and isolated saffron compounds to NMDA and σ_1 (Sigma-1) receptors. *Planta Med* 74:764-772
- Lee J, Jang DS, Yoo NH et al (2010a) Single-step separation of bioactive flavonol glucosides from *Osteomeles schwerinae* by high-speed counter-current chromatography. *J Sep Sci* 33:582-586
- Lee JH, Ha YW, Jeong CS et al (2009) Isolation and tandem mass fragmentations of an anti-inflammatory compound from *Aralia elata*. *Archiv Pharmacol Res* 32:831-840
- Lee YS, Kim SH, Kim JK (2011) Preparative isolation and purification of seven isoflavones from *Belamcanda chinensis*. *Phytochem Anal* 22:468-473
- Lee YS, Kim SH, Kim JK et al (2010b) Rapid identification and preparative isolation of antioxidant components in licorice. *J Sep Sci* 33:664-671
- Lee YW, Cook CE, Fang QC et al (1989) Application of analytical high-speed counter-current chromatography to the isolation of bioactive natural products. *J Chromatogr* 477:434-438
- Lei L, Yang F, Zhang T et al (2001) Preparative isolation and purification of acteoside and 2'-acetyl acteoside from *Cistanches salsa* (C.A.Mey) G. Beck by high-speed counter-current chromatography. *J Chromatogr A* 912:181-185
- Leitao GG, Leitao SG, Vilegas W (2002). Quick preparative separation of natural naphthopyranones with antioxidant activity by high speed counter current chromatography. *Z Naturforsch C* 57:1051-1055
- Leitao GG, De Souza PA, Moraes AA et al (2005b) Step-gradient CCC separation of phenylpropanoid and iridoid glycosides from roots of *Stachytarpheta cayennensis* (Rich.) Vahl. *J Liq Chromatogr & Rel Technol* 28:2053-2060
- Leitao GG, El-Adji SS, Araújo Lopes De Melo W et al (2005a) Separation of free and glycosylated flavonoids from *Siparuna guianensis* by gradient and isocratic CCC. *J Liq Chromatogr & Rel Technol* 28:2041-2051
- Leite AC, Cabral EC, Dos Santos DAP et al (2005) Isolation of the alkaloid ricinine from the leaves of *Ricinus communis* (Euphorbiaceae) through counter-current chromatography. *Quim Nova* 28:983-985

- Li A, Sun A Liu R (2012f) Preparative isolation and purification of three flavonoids from the chinese medicinal plant *Alpinia katsumadai* Hayata by high-speed counter-current chromatography. *J Liq Chromatogr & Rel Technol* 35:2900-2909
- Li A, Sun A, Liu R (2005a) Preparative isolation and purification of costunolide and dehydrocostuslactone from *Aucklandia lappa* Decne by high-speed counter-current chromatography. *J Chromatogr A* 1076:193-197
- Li A, Zhang Y, Sun A et al (2012c) Preparative isolation and purification of phenolic acids from the dried buds of *Lonicera japonica* Thunb by high-speed counter-current chromatography in gradient elution mode. *J Liq Chromatogr & Rel Technol* 35:1933-1944
- Li B, Du W, Qian D et al (2012e) Combination of high-speed countercurrent chromatography and reversed phase C₁₈ chromatography for large-scale isolation of cyanidin-3-O- β -D-glucoside from black rice bran extract. *Ind Crops Prod* 37:88-92
- Li B, Meng X, Zhu L et al. (2014c) Application of high-speed counter-current chromatography for isolation of triterpenes from *Schisandra chinensis* (Turcz.) Baill and induction apoptosis mechanism of HSC-T6. *Biomed Mater Eng* 24:969-977
- Li F, Lin Y, Wang X et al (2009) Preparative isolation and purification of capsaicinoids from *Capsicum frutescens* using high-speed counter-current chromatography. *Sep Purif Technol* 64:304-308
- Li FY, Gou ZP, Ma XC et al (2010c) Preparative isolation and purification of two phenylpropanoids from *Daphne giraldii* Nitsche by HSCCC. *Chromatographia* 71:481-485
- Li HB, Lai JP, Jiang Y et al. (2002) Preparative isolation and purification of salvianolic acid B from the Chinese medicinal plant *Salvia miltiorrhiza* by high speed counter current chromatography. *J Chromatogr A* 943:235-239
- Li HB, Chen F (2001a) Preparative isolation and purification of astaxanthin from the microalga *Chlorococcum* sp. by high-speed counter-current chromatography. *J Chromatogr* 925:133-137
- Li HB, Chen F (2001b) Preparative isolation and purification of six diterpenoids from the Chinese medicinal plant *Salvia miltiorrhiza* by high-speed counter-current chromatography. *J Chromatogr A* 925:109-114
- Li HB, Chen F (2001c) Preparative isolation and purification of salidroside from the Chinese medicinal plant *Rhodiola sachalinensis* by high-speed counter-current chromatography. *J Chromatogr A* 932:91-95
- Li HB, Chen F (2004a) Preparative isolation and purification of chuanxiongine from the medicinal plant *Ligusticum chuanxiong* by high speed counter current chromatography. *J Chromatogr A* 1047:249-253
- Li HB, Chen F (2004b) Preparative isolation and purification of gastrodin from the Chinese medicinal plant *Gastrodia elata* by high speed counter current chromatography. *J Chromatogr A* 1052:229-232
- Li HB, Chen F (2004c) Preparative isolation and purification of bergapten and imperatorin from the medicinal plant *Cnidium monnieri* using high speed counter current chromatography by stepwise increasing the flow rate of the mobile phase. *J Chromatogr A* 1061:51-54
- Li HB, Chen F (2005a) Preparative isolation and purification of phillyrin from the medicinal plant *Forsythia suspensa* by high-speed counter-current chromatography. *J Chromatogr A* 1083:102-105
- Li HB, Chen F (2005b) Isolation and purification of baicalein, wogonin and oroxylin A from the medicinal plant *Scutellaria baicalensis* by high-speed counter-current chromatography. *J Chromatogr A* 1074:107-110
- Li HB, Chen F (2009) Separation and purification of epimedin A, B, C, and icariin from the medicinal herb *Epimedium brevicornum* maxim by dual-mode HSCCC. *J Chromatogr Sci* 47:337-340
- Li HB, Chen F, Zhang TY et al (2001) Preparative isolation and purification of lutein from the microalga *Chlorella vulgaris* by high-speed counter-current chromatography. *J Chromatogr* 905:151-155
- Li HB, Fan KW, Chen F (2006) Isolation and purification of canthaxanthin from the microalga *Chlorella zofingiensis* by high-speed counter-current chromatography. *J Sep Sci* 29:699-703
- Li HB, Jiang Y, Chen F (2004) Separation methods used for *Scutellaria baicalensis* active components. *Journal of Chromatogr B* 812:277-290
- Li HB, Chen F (2005c) Simultaneous separation and purification of five bioactive coumarins from the Chinese medicinal plant *Cnidium monnieri* by high-speed counter-current chromatography. *J Sep Sci* 28:268-272
- Li HM, Kim JK, Jang JM et al (2013b) Analysis of the inhibitory activity of *Abeliophyllum distichum* leaf constituents against aldose reductase by using high-speed counter current chromatography. *Archiv Pharm Res* 36:1104-1112
- Li J, Gu D, Liu Y et al (2013d) Large-scale separation of ricinine from a by-product of *Ricinus communis* L. by pH-zone-refining counter-current chromatography. *Ind Crops Prod* 49:160-163
- Li J, Ma X, Li F et al (2010b) Preparative separation and purification of bufadienolides from Chinese traditional medicine of *ChanSu* using high-speed counter-current chromatography. *J Sep Sci* 33:1325-1330
- Li J, Zhang Y, Lin Y et al (2013c) Preparative separation and purification of bufadienolides from chansu by high-speed counter-current chromatography combined with preparative HPLC. *Quim Nova* 36:686-690
- Li JB, Du LW, Zhou XM et al (2013e) Fractionation of extract from *Ligusticum chuanxiong* (Apiaceae) by high speed counter current chromatography and their efficacy in rice against S-metolachlor injury. *Asian J Chem* 25 1613-1617
- Li JY, Dong GP, Li ML et al (2012d) Efficient counter-current chromatographic isolation and structural identification of phenolic compounds from sweet potato leaves. *J Liq Chromatogr & Rel Technol* 35:1517-1527
- Li K, Zhang H, Xie H et al (2011a) Preparative isolation and purification of five flavonoids from *Pogostemon cablin* Benth by high-speed counter-current chromatography and preparative high-performance liquid chromatography. *J Liq Chromatogr & Rel Technol* 34:1617-1629
- Li L, Liu CM, Liu ZQ et al (2008a) Isolation and purification of phenylethanoid glycosides from plant extract of *Plantago asiatica* by high performance centrifugal partition chromatography. *Chin Chem Lett* 19:1349-1352

- Li L, Tsao R, Yang R et al (2008b) Isolation and purification of phenylethanoid glycosides from *Cistanche deserticola* by high-speed counter-current chromatography. *Food Chem* 108:702–710
- Li L, Yang Y, Hou X et al (2013f) Bioassay-guided separation and purification of water-soluble antioxidants from *Carthamus tinctorius* L. by combination of chromatographic techniques. *Sep Purif Technol* 104:200-207
- Li L, Tsao R, Liu Z et al (2005b) Isolation and purification of acteoside and isoacteoside from *Plantago psyllium* L. by high-speed counter-current chromatography. *J Chromatogr A* 1063:161-169
- Li S, He S, Zhong S et al (2011b) Elution-extrusion counter-current chromatography separation of five bioactive compounds from *Dendrobium chrysotoxum* Lindl. *J Chromatogr A* 1218:3124-3128
- Li S, Wang W, Tang H et al. (2014b) Comparison of counter-current chromatography and preparative high performance liquid chromatography applied to separating minor impurities in drug preparations. *J Chromatogr A* 1344:51-58
- Li S, Zhao M, Li Y et al. (2014a) Preparative isolation of six anti-tumour biflavonoids from *Selaginella doederleinii* Hieron by high-speed counter-current chromatography. *Phytochem Anal* 25:127-133
- Li WC, Wang XY, Lin PC et al (2013a) Preparative separation and purification of four cis-trans isomers of coumaroylspermidine analogs from safflower by high-speed counter-current chromatography. *J Chromatogr B* 938:75-79
- Li X, Li X, Song S et al (2012a) Preparative isolation and purification of scopoletin from *Lycium barbarum* L. By high-speed countercurrent chromatography. *Chin J Chromatogr* 30:971-974
- Li X, Sun A, Liu R et al (2012b) Preparative separation and purification of biondnoid I and magnolin from the chinese medicinal plant *flos Magnoliae* by high-speed counter-current chromatography. *J Liq Chromatogr & Rel Technol* 35:2304-2312
- Li XC, Zhang QW, Yin ZQ et al (2011c) Preparative separation of patchouli alcohol from patchouli oil using high performance centrifugal partition chromatography. *J Ess Oil Res* 23:19-24
- Li Y, Cao X (2012) Isolation and characterization of furohyperforin from *Hypericum perforatum* L. by high-speed countercurrent chromatography. *J Liq Chromatogr & Rel Technol* 35:2558-2566
- Li YN, Yin LH, Xu LN et al (2010a) A simple and efficient protocol for large-scale preparation of three flavonoids from the flower of *Daphne genkwa* by combination of macroporous resin and counter-current chromatography. *J Sep Sci* 33:2168-2175
- Liang H, Li C, Yuan Q et al (2008) Application of high-speed countercurrent chromatography for the isolation of sulforaphane from broccoli seed meal. *J Agric Food Chem* 56:7746-7749
- Liang J, He J, Zhu S et al (2013b) Preparation of main iridoid glycosides in *Fructus Corni* by macroporous resin column chromatography and countercurrent chromatography. *J Liq Chromatogr & Rel Technol* 36:983-999
- Liang J, Meng J, Guo M et al (2013a) Conical coils counter-current chromatography for preparative isolation and purification of tanshinones from *Salvia miltiorrhiza* Bunge. *J Chromatogr A* 1288:35-39
- Liang J, Yang Z, Cao X et al (2011a) Preparative isolation of novel antioxidant flavonoids of alfalfa by stop-and-go counter-current chromatography and following on-line liquid chromatography desalination. *J Chromatogr A* 1218:6191-6199
- Liang S, Liang Y, He J et al (2012) Separation and purification of three flavonoids from *Daphne genkwa* Sieb. et Zucc.: Comparison in performance between medium-pressure liquid chromatography and high-speed countercurrent chromatography. *J Liq Chromatogr & Rel Technol* 35:2610-2622
- Liang Y, Wei L, Zhu Z et al (2011b) Isolation and purification of kaempferol-3,7-O- α -L-dirhamnopyranoside from *Siraitia grosvenori* leaves by high-speed counter-current chromatograph and its free radical scavenging activity. *Sep Sci Technol* 46:1528-1533
- Liang Y, Hu J, Chen H et al (2007a) Preparative isolation and purification of four compounds from Chinese medicinal herb *Gentiana scabra* Bunge by high-speed countercurrent chromatography. *J Liq Chromatogr & Rel Technol* 30:509-520
- Liang Y, Huang Z, Chen H et al (2007b) Preparative isolation and purification of two closely related glycosidic flavonoids from *Exocarpium Citri Grandis* by high-speed countercurrent chromatography. *J Liq Chromatogr & Rel Technol* 30:419-430
- Liang Z, Xie Z, Lam S et al. (2014b) Optimization of the fractional precipitation of paclitaxel from a *Taxus chinensis* cell culture using response surface methodology and its isolation by consecutive high-speed countercurrent chromatography. *J Sep Sci* 37:2322-2330
- Liang Z, Yang M, Xu X et al. (2014a) Isolation and purification of geniposide, crocin-1, and geniposidic acid from the fruit of *Gardenia jasminoides* Ellis by high-speed counter-current chromatography. *Sep Sci Technol* 49:1427-1433
- Lijin Z, Xiao W, Jianhua L et al (2009) Use of pH-zone refining countercurrent chromatography for preparative separation of fangchinoline and tetrandrine from *Stephania tetrandra*. *Chromatographia* 69:959-962
- Lim SS, Lee MY, Ahn HR et al (2011) Preparative isolation and purification of antioxidative diarylheptanoid derivatives from *Alnus japonica* by high-speed counter-current chromatography. *J Sep Sci* 34:3344-3352
- Ling JY, Zhang GY, Cui ZJ et al (2007) Supercritical fluid extraction of quinolizidine alkaloids from *Sophora flavescens* Ait. and purification by high-speed counter-current chromatography. *J Chromatogr A* 1145:123-127
- Liu D, Shu X, Wang X et al (2013a) Preparative separation of C₁₉-diterpenoid alkaloids from *Aconitum carmichaelii* Debx by pH-zone-refining counter-current chromatography. *Quim Nova* 36:1366-1369
- Liu D, Su Z, Wang C et al (2009c) Separation of five isomers of dihydroxybenzoic acid by high-speed counter-current chromatography with dual-rotation elution method. *J Chromatogr Sci* 47:345-348
- Liu D, Su Z, Wang C et al (2010a) Separation and purification of hydrolyzable tannin from *Geranium wilfordii* Maxim by reversed-phase and normal-phase high-speed counter-current chromatography. *J Sep Sci* 33:2266-2271

- Liu F, Xi X, Wang M et al. (2014c) Isolation and purification of arctigenin from *Fructus Arctii* by enzymatic hydrolysis combined with high-speed counter-current chromatography. *J Sep Sci* 37:376-381
- Liu H, Yuan Q, Li CF et al (2010b) Isolation and purification of silychristin, silydianin and taxifolin in the co-products of the silybin refined process from the silymarin by high-speed counter-current chromatography. *Process Biochem* 45:799-804
- Liu J, Liu R, Sun A et al (2013c) Connection of high-speed counter-current chromatography with evaporative light scattering detector by flow injection and its application for preparative isolation and purification of ginkgolide compounds from *Ginkgo biloba* L. *J Liq Chromatogr & Rel Technol* 36:2317-2329
- Liu JH, Zhao SC, Wang X et al (2008b) Preparation and separation of cichoric acid from *Echinacea purpurea* by high speed counter-current chromatography. *Chin J Anal Chem* 36:964-966
- Liu L, Sun A, Wu S et al (2009d) Preparative purification of morroniside and loganin from *Fructus Corni* by combination of macroporous absorption resin and HSCCC. *J Chromatogr Sci* 47:333-336
- Liu L, Xu X, Cheng D et al (2012a) Preparative separation of polymethoxylated flavones from Ponkan (*Citrus reticulata* Blanco cv. Ponkan) peel by high-speed countercurrent chromatography and their antifungal activities against *Aspergillus niger*. *Eur Food Res Technol* 235:631-635
- Liu M, Yang F, Shi H et al (2013b) Preparative separation of triterpene alcohol ferulates from rice bran oil using a high performance counter-current chromatography. *Food Chem* 139:919-924
- Liu M, Zhang S, Yang C et al (2011c) Isolation and structure identification of C₁₉ diterpenoid alkaloids from *Aconitum carmichaeli* by high-speed counter-current chromatography. *Chin J Chromatogr* 29:430-434
- Liu R, Chu X, Sun A et al (2005b) Preparative isolation and purification of alkaloids from the Chinese medicinal herb *Evodia rutaecarpa* (Juss.) Benth by high-speed counter-current chromatography. *J Chromatogr A* 1074:139-144
- Liu R, Feng L, Sun A et al (2004b) Preparative isolation and purification of coumarins from *Cnidium monneri* (L.) Cusson by high speed counter current chromatography. *J Chromatogr A* 1055:71-76
- Liu R, Feng Lei, Sun A et al (2004c) Preparative isolation and purification of coumarins from *Peucedanum praeruptorum* Dunn by high speed countercurrent chromatography. *J Chromatogr A* 1057:89-94
- Liu R, Kong L, Li A et al (2007c) Preparative isolation and purification of saponin and flavone glycoside compounds from *Clinopodium chinensis* (Benth) O. Kuntze by high-speed countercurrent chromatography. *J Liq Chromatogr & Rel Technol* 30:521-532
- Liu R, Li A, Sun A (2004a) Preparative isolation and purification of coumarins from *Angelica dahurica* (Fisch.ex Hoffm) Benth. et Hook (Chinese traditional medicinal herb) by high speed counter current chromatography. *J Chromatogr A* 1052:223-227
- Liu R, Lu Y, Wu T et al (2008c) Simultaneous isolation and purification of mollugin and two anthraquinones from *Rubia cordifolia* by HSCCC. *Chromatographia* 68:95-99
- Liu R, Sun Q, Shi Y et al (2005a) Isolation and purification of coumarin compounds from the root of *Peucedanum decursivum* (Miq.) Maxim by high-speed counter-current chromatography. *J Chromatogr A* 1076:127-132
- Liu R, Wu S, Sun A (2008e) Separation and purification of four chromones from *Radix Saposhnikoviae* by high-speed counter-current chromatography. *Phytochem Anal* 19:206-211
- Liu R, Xu L, Li A et al. (2010c) Preparative isolation of flavonoid compounds from *Oroxylum indicum* by high-speed counter-current chromatography by using ionic liquids as the modifier of twophase solvent system. *J Sep Sci* 33:1058-1063
- Liu R, Li A, Sun A et al (2005d) Preparative isolation and purification of three flavonoids from the Chinese medicinal plant *Epimedium koreanum* Nakai by high-speed counter-current chromatography. *J Chromatogr A* 1064:53-57
- Liu R, Sun Q, Sun A et al (2005c) Isolation and purification of coumarin compounds from *Cortex fraxinus* by high-speed counter-current chromatography. *J Chromatogr A* 1072:195-199
- Liu S, Cao M, Li D et al (2011b) Purification and anticancer activity investigation of pentacyclic triterpenoids from the leaves of *Sinojackia sarcocarpa* L.Q. Luo by high-speed counter-current chromatography. *Nat Prod Res* 25:1600-1606
- Liu S, Wang B, Li XZ et al (2009a) Preparative separation and purification of liensinine, isoliensinine and neferine from seed embryo of *Nelumbo nucifera* Gaertn using high-speed counter-current chromatography. *J Sep Sci* 32:2476-2481
- Liu W, Luo J, Kong L (2011d) Application of complexation high-speed counter-current chromatography in the separation of 5-hydroxyisoflavone isomers from *Belamcanda chinensis* (L.) DC. *J Chromatogr A* 1218:1842-1848
- Liu XH, Wang Z, Wu Q et al. (2014d) Isolation of anthocyanin from *Hibiscus sabdariffa* by high speed counter-current chromatography. *Modern Food Sci Technol* 30:190-194
- Liu Y, Chen SN, McAlpine JB et al. (2014a) Quantification of a botanical negative marker without an identical standard: Ginkgotoxin in *Ginkgo biloba*. *J Nat Prod*. 77:611-617
- Liu Y, Chen T, Chen C et al. (2014e) Isolation and preparation of an imidazole alkaloid from radix of *Aconitum pendulum* Busch by semi-preparative high-speed counter-current chromatography. *Chin J Chromatogr* 32:543-546
- Liu Y, Chen T, Wang P et al (2012b) Preparative separation of two xanthenes from *Halenia elliptica* by high-speed counter-current chromatography. *Chin J Chromatogr* 30:543-546
- Liu Y, Chou G (2007) Isolation and preparation of flavones from the leaves of *Lindera aggregata* using high speed counter-current chromatography. *Chin J Chromatogr* 25:735-739
- Liu Y, Wang G, Huang X et al. (2014b) Use of O-carboxymethyl chitosan in high-speed counter-current chromatography: A novel additive for a biphasic solvent system. *New J Chem* 38:1150-1157
- Liu Z, Du Q, Wang K et al (2009b) Completed preparative separation of alkaloids from *Cephalotaxus fortunei* by step-pH-gradient high-speed counter-current chromatography. *J Chromatogr A* 1216:4663-4667

- Liu Z, Wang J, Bi J et al (2011a) Separation and purification of three high-purity isoflavonoids from *Belamcanda chinensis* (L.) DC. by supercritical fluid extraction and high-speed counter-current chromatography. *Sep Sci Technol* 46:2501-2509
- Liu Z, Yu Y, Shen P et al (2008d) Separation and purification of dl-tetrahydropalmatine from *Corydalis yanhusuo* by high-speed counter-current chromatography. *Sep Purif Technol* 58:343-346
- Liu Z, Jin Y, Shen P et al (2007b) Separation and purification of verticine and verticinone from Bulbus *Fritillariae Thunbergii* by high-speed counter-current chromatography coupled with evaporative light scattering detection. *Talanta* 71:1873-1876
- Liu Z, Sun Y, Wang J et al (2008a) Preparative isolation and purification of acetophenones from the Chinese medicinal plant *Cynanchum bungei* Decne. by high-speed counter-current chromatography. *Sep Purif Technol* 64:247-252
- Liu Z, Wang J, Shen P et al (2006) Microwave-assisted extraction and high-speed counter-current chromatography purification of ferulic acid from *Radix Angelicae sinensis*. *Sep Purif Technol* 52:18-21
- Liu ZL, Wang J, Shen PN et al (2007a) Study on the extraction and purification of ferulic acid in *Angelica sinensis*. *J Chem Engin Chin Univ* 21:1008-1012
- Long L, Song Y, Wu J et al (2006) Development of an efficient method for the preparative isolation and purification of chlorophyll a from a marine dinoflagellate *Amphidinium carterae* by high-speed counter-current chromatography coupled with reversed-phase high-performance liquid chromatography. *Anal Bioanal Chem* 386:2169-2174
- Lopes-Lutz D, Mudge E, Ippolito R et al (2011) Purification of alkylamides from *Echinacea angustifolia* (DC.) Hell. roots by high-speed countercurrent chromatography. *J Agric Food Chem* 59:491-494
- Lu HT, Jiang Y, Chen F (2003a) Preparative separation and purification of squalene from the microalga *Thraustochytrium* ATCC 26185 by high speed counter current chromatography. *J Chromatogr* 994:37-43
- Lu HT, Jiang Y, Chen F (2003b) Application of high speed counter current chromatography to the preparative separation and purification of baicalin from the Chinese medicinal plant *Scutellaria baicalensis*. *J Chromatogr A* 1017:117-123
- Lu HT, Jiang Y, Chen F (2004a) Application of preparative high speed counter current chromatography for separation of chlorogenic acid from *Flos Lonicerae*. *J Chromatogr A* 1026:185-190
- Lu HT, Jiang Y, Chen F (2004b) Preparative high speed counter current chromatography for purification of shikonin from the Chinese medicinal plant *Lithospermum erythrorhizon*. *J Chromatogr A* 1023:159-163
- Lü HT, Liu J, Deng R et al (2012) Preparative isolation and purification of indigo and indirubin from *folium Isatidis* by high-speed counter-current chromatography. *Phytochem Anal* 23:637-641
- Lu J, Wei Y, Yuan Q (2007a) Preparative separation of punicalagin from pomegranate husk by high-speed countercurrent chromatography. *J Chromatogr B* 857:175-179
- Lu JJ, Wei Y, Yuan QP (2007c) Preparative separation of gallic acid from Chinese traditional medicine by high-speed counter-current chromatography and followed by preparative liquid chromatography. *Sep Purif Technol* 55:40-43
- Lu Y, Dong G, Gu Y et al (2013) Separation of chlorogenic acid and concentration of trace caffeic acid from natural products by pH-zone-refining countercurrent chromatography. *J Sep Sci* 36:2210-2215
- Lu Y, Sun C, Liu R, Pan Y (2007d) Effective two-dimensional counter-current chromatographic method for simultaneous isolation and purification of oridonin and ponacidin from the crude extract of *Rabdosia rubescens*. *J Chromatogr A* 1146:125-130
- Lu Y, Sun C, Pan Y (2006a) A comparative study of upright counter-current chromatography and high-performance liquid chromatography for preparative isolation and purification of phenolic compounds from *Magnoliae officinalis*. *J Sep Sci* 29:351-357
- Lu Y, Sun C, Wang Y et al (2007e) Two-dimensional counter-current chromatography for the preparative separation of prenylflavonoids from *Artocarpus altilis* *J Chromatogr A* 1151:31-36
- Lu Y, Li J, Li M et al (2012) Efficient counter-current chromatographic isolation and structural identification of two new cinnamic acids from *Echinacea purpurea*. *Nat Prod Commun* 7:1353-1356
- Lu Y, Liu R, Sun C et al (2007b) An effective high-speed countercurrent chromatographic method for preparative isolation and purification of mollugin directly from the ethanol extract of the Chinese medicinal plant *Rubia cordifolia*. *J Sep Sci* 30:1313-1317
- Lu Y, Sun C, Pan Y (2006b) Isolation and purification of oridonin from *Rabdosia rubescens* using upright counter-current chromatography. *J Sep Sci* 29:314-318
- Lu Y, Sun C, Wang Y et al (2005) Preparative isolation and purification of two phenylbutenoids from the rhizomes of *Zingiber cassumunar* by upright counter-current chromatography. *J Chromatogr A* 1089:258-262
- Luo H, Peng M, Ye H et al (2010) Predictable and linear scale-up of four phenolic alkaloids separation from the roots of *Menispermum dauricum* using high-performance counter-current chromatography. *J Chromatogr B* 878:1929-1933
- Luo J, Li L, Kong L (2012) Preparative separation of phenylpropanoid glycerides from the bulbs of *Lilium lancifolium* by high-speed counter-current chromatography and evaluation of their antioxidant activities. *Food Chem* 131:1056-1062
- Ma B, Wang J, Liu C.M et al. (2014a) Isolation and purification of seven compounds from extract of *Rheum Palmatum* L. by high speed counter current chromatography and rapid preparative chromatography. *J Liq Chromatogr & Rel Technol* 37:2546-2557
- Ma C, Hu L, Fu Q et al (2013) Separation of four flavonoids from *Rhodiola rosea* by on-line combination of sample preparation and counter-current chromatography. *J Chromatogr A* 1306:12-19
- Ma C, Li G, Zhang J et al (2009) An efficient combination of supercritical fluid extraction and high-speed counter-current chromatography to extract and purify homoisoflavonoids from *Ophiopogon japonicus* Thunb.) Ker-Gawler. *J Sep Sci* 32:1949-1956

- Ma C, Wang J, Chu H et al. (2014b) Purification and characterization of aporphine alkaloids from leaves of *Nelumbo nucifera* Gaertn and their effects on glucose consumption in 3T3-L1 adipocytes. *Int J Mol Sci* 15:3481-3494
- Ma CH, Ke W, Sun ZL et al (2006) Large-scale isolation and purification of scoparone from *Herba Artemisiae scopariae* by high-speed counter-current chromatography. *Chromatographia* 64:83-87
- Ma CJ, Li GS, Zhang DL et al (2005a) One step isolation and purification of liquiritigenin and isoliquiritigenin from *Glycyrrhiza uralensis* Risch. using high-speed counter-current chromatography. *J Chromatogr A* 1078:188-192
- Ma J, Chen Q, Lai D et al (2010c) Separation and purification of triterpene saponins from roots of *radix Phytolaccae* by high-speed countercurrent chromatography coupled with evaporative light scattering detection. *J Liq Chromatogr & Rel Technol* 33:563-571
- Ma X, Tu P, Chen Y et al (2004) Preparative isolation and purification of isoflavan and pterocarpan glycosides from *Astragalus membranaceus* Bge. var. *mongholicus* (Bge.) Hsiao by high speed counter current chromatography. *J Chromatogr A* 1023:311-315
- Ma X, Tu P, Chen Y et al (2005b) Preparative isolation and purification of calycosin and formononetin from *Astragalus membranaceus* Bge. var. *mongholicus* (Bge.) Hsiao by high-speed counter-current chromatography. *Chin J Chromatogr* 23:299-301
- Ma X, Tu P, Zhang T et al (2003) Preparative isolation and purification of two isoflavones from *Astragalus membranaceus* Bge. var. *mongholicus* (Bge.) Hsiao by high speed countercurrent chromatography. *J Chromatogr A* 992:193-197
- Ma X, Wu L, Ito Y et al (2005c) Application of preparative high-speed counter-current chromatography for separation of methyl gallate from *Acer truncatum* Bunge. *J Chromatogr A* 1076:212-215
- Ma X, Zhang T, Wei Y, Tu P, Chen Y, Ito Y (2002) Preparative isolation and purification of calycosin from *Astragalus membranaceus* Bge. var. *mongholicus* (Bge.) Hsiao by high speed counter current chromatography. *J Chromatogr A* 962:243-247
- Ma X, Tian W, Wu L et al (2005e) Isolation of quercetin-3-O-L-rhamnoside from *Acer truncatum* Bunge by high-speed counter-current chromatography. *J Chromatogr A* 1070:211-214
- Ma XC, Sun C, Huang SS et al (2010a) Preparative isolation and purification of four prenylflavanones from microbial biotransformation of kurarinone by high-speed counter-current chromatography. *Sep Purif Technol* 76:140-145
- Ma XC, Xin X, Zhang BJ et al (2010b) Efficient isolation and purification of five products from microbial biotransformation of cinobufagin by high-speed counter-current chromatography. *J Sep Sci* 33:2272-2277
- Ma Y, Aisha HA, Liao L et al (2005d) Preparative isolation and purification of rupestonic acid from the Chinese medicinal plant *Artemisia rupestris* L. by high-speed counter-current chromatography. *J Chromatogr A* 1076:198-201
- Maciuk A, Toribio A, Zeches-Hanrot M et al (2005) Purification of rosmarinic acid by strong ion-exchange centrifugal partition chromatography. *J Liq Chromatogr & Rel Technol* 28:1947-1957
- Maier T, Sanzenbacher S, Kammerera DR et al (2006) Isolation of hydroxycinnamoyltartaric acids from grape pomace by high-speed counter-current chromatography. *J Chromatogr A* 1128:61-67
- Majak W, Benn M, McEwan D et al (1992) Three nitropropanoyl esters of glucose from *Indigofera linnaei*. *Phytochemistry* 31:2393-2395
- Malherbe CJ, Willenburg E, De Beer D et al. (2014) Iriflophenone-3-C-glucoside from *Cyclopia genistoides*: Isolation and quantitative comparison of antioxidant capacity with mangiferin and isomangiferin using on-line HPLC antioxidant assays. *J Chromatogr B* 951-952:164-171
- Marston A, Borel C, Hostettmann K (1988) Separation of natural products by centrifugal partition chromatography. *J Chromatogr* 450:91-99
- Martin AM, Queiroz EF, Marston A et al (2006) Labdane diterpenes from *Juniperus communis* L. berries. *Phytochem Anal* 17:32-35
- Matsuda S, Matsudo K, Ito Y (2003) Separation of phospholipids and glycolipids using analytical toroidal coil counter current chromatography. II. Comparison of the hydrophobicity between *Mycoplasmas fermentans* and human brain lipids. *J Liq Chromatogr & Rel Technol* 26:1135-1147
- Maurya A, Gupta S, Negi S et al (2009) pH-zone-refining centrifugal partition chromatography for preparative isolation and purification of steroidal glycoalkaloids from *Solanum xanthocarpum*. *J Sep Sci* 32:3126-3132
- Maurya A, Gupta S, Srivastava SK (2011) Preparative isolation of bioactive nitrile glycoside "niazirin" from the fruits of *Moringa oleifera* using fast centrifugal partition chromatography. *Sep Sci Technol* 46:1195-1199
- Maurya A, Gupta S, Srivastava SK (2013) Large-scale separation of antipsychotic alkaloids from *Rauwolfia tetraphylla* L. by pH-zone-refining fast centrifugal partition chromatography. *J Sep Sci* 36:407-413
- Maurya A, Srivastava SK (2009) Large-scale separation of clavine alkaloids from *Ipomoea muricata* by pH-zone-refining centrifugal partition chromatography. *J Chromatogr B* 877:1732-1736
- Maurya A, Srivastava SK (2011) Preparative-scale separation of anticancer triterpenes from *Eucalyptus hybrid* by centrifugal partition chromatography. *Sep Sci Technol* 46:1189-1194
- Maver M, Queiroz EF, Wolfender JL et al (2005) Flavonoids from the stem of *Eriophorum scheuchzeri*. *J Nat Prod* 68:1094-1098
- Mbeunkui F, Grace MH, Lategan C et al (2011) Isolation and identification of antiplasmodial N-alkylamides from *Spilanthes acmella* flowers using centrifugal partition chromatography and ESI-IT-TOF-MS. *J Chromatogr B* 879:1886-1892
- Mbeunkui F, Grace MH, Lila MA (2012a) Isolation and structural elucidation of indole alkaloids from *Geissospermum vellosii* by mass spectrometry. *J Chromatogr B* 885-886:83-89

- Mbeunkui F, Grace MH, Yousef GG (2012b) Isolation and characterization of flavonols from blackcurrant by high-performance counter-current chromatography and electrospray ionization tandem mass spectrometry. *J Sep Sci* 35:1682-1689
- Meng J, Yang Z, Liang J et al. (2014a) Multi-channel recycling counter-current chromatography for natural product isolation: Tanshinones as examples. *J Chromatogr A* 1327:27-38
- Meng J, Yang Z, Liang J et al. (2014b) Comprehensive multi-channel multi-dimensional counter-current chromatography for separation of tanshinones from *Salvia miltiorrhiza* Bunge. *J Chromatogr A* 1323:73-81
- Meng L, Liu R, Sun A et al (2009) Separation and purification of rutin and acacin from the chinese medicinal herb *Herba Cirsii* by combination of macroporous absorption resin and high-speed counter-current chromatography. *J Chromatogr Sci* 47:329-332
- Mezache N, Derbré S, Akkal S et al (2009) Fast counter current chromatography of *n*-butanolic fraction from *Senecio giganteus* (Asteraceae). *Nat Prod Commun* 4:1357-1362
- Miao P, Cai DC, Xiang BR et al (1998) Separation and purification of strychnine from crude extract of *Strychnos nux-vomica* L. by high-speed countercurrent chromatography. *J Liq Chromatogr & Rel Technol* 21:163-170
- Michel T, Destandau E, Fougère L et al (2012) New "hyphenated" CPC-HPLC-DAD-MS strategy for simultaneous isolation, analysis and identification of phytochemicals: Application to xanthones from *Garcinia mangostana*. *Anal Bioanal Chem* 404:2963-2972
- Michel T, Destandau E, Pecher V (2011) Two-step centrifugal partition chromatography (CPC) fractionation of *Butea monosperma* (Lam.) biomarkers. *Sep Purif Technol* 80: 32-37
- Mikell JR, Schaneberg BT, Khan IA (2003) Isolation and purification of Kava lactones by high performance centrifugal partition chromatography. *J Liq Chromatogr & Rel Technol* 26:3069-3074
- Montilla EC, Arzaba MR, Hillebrand S et al (2011) Anthocyanin composition of black carrot (*Daucus carota* ssp. *sativus* var. *atrarubens* Alef.) cultivars Antonina, Beta Sweet, Deep Purple, and Purple Haze. *J Agric Food Chem* 59:3385-3390
- Montilla EC, Hillebrand S, Butschbach D et al (2010) Preparative isolation of anthocyanins from Japanese purple sweet potato (*Ipomoea batatas* L.) varieties by high-speed countercurrent chromatography. *J Agric Food Chem* 58:9899-9904
- Morel S, Landreau A, Nguyen VH et al (2012) Preparative isolation, fast centrifugal partition chromatography purification and biological activity of cajaflavanone from *Derris ferruginea* stems. *Phytochem Anal* 23:152-158
- Mudge E, Lopes-Lutz D, Brown PN et al (2013) Purification of phenylalkanoic acids and monoterpene glycosides from *Rhodiola rosea* L. roots by high-speed counter-current chromatography. *Phytochem Anal* 24:129-134
- Nasser ALM, Mazzolin LP, Hiruma-Lima CA et al (2006) Preparative droplet counter-current chromatography for the separation of the new nor-seco-triterpene and pentacyclic triterpenoids from *Qualea parviflora*. *Chromatographia* 64:695-699
- Nitz S, Spraul MH, Drawert F (1990) C17 polyacetylenic alcohols as the major constituents in roots of *Petroselinum crispum* Mill. ssp. *tuberosum*. *J Agric Food Chem* 38:1445-1447
- Nitz S, Spraul MH, Drawert F et al (1992) 3-butyl-5,6-dihydro-4H-isobenzofuran-1-one, a sensorial active phthalide in parsley roots. *J Agric Food Chem* 40:1038-1040
- Niu L, Xie Z, Cai T (2011) Preparative isolation of alkaloids from *Corydalis bungeana* Turcz. by high-speed counter-current chromatography using stepwise elution. *J Sep Sci* 34:987-994
- Noguer M, Cerezo AB, Rentzsch M et al (2008) Simulated digestion and antioxidant activity of red wine fractions separated by high speed countercurrent chromatography. *J Agric Food Chem* 56:8879-8884
- Oka H, Oka F, Ito Y (1989) Multilayer coil planet centrifuge for analytical high-speed counter-current chromatography. *J Chromatogr* 479:53-60
- Okunji C, Komarnytsky S, Fear G et al (2007) Preparative isolation and identification of tyrosinase inhibitors from the seeds of *Garcinia kola* by high-speed counter-current chromatography. *J Chromatogr A* 1151:45-50
- Okunji CO, Iwu MM, Ito Y et al (2005) Preparative separation of indole alkaloids from the rind of *Picralima nitida* (Stapf) T. Durand & H. Durand by pH-zone-refining countercurrent chromatography. *J Liq Chromatogr & Rel Technol* 28:775-783
- Oliveira RR, Moraes MC, Castilho RO et al (2003) High speed countercurrent chromatography as a valuable tool to isolate C glycosylflavones from *Cecropia lyratiloba* Miquel. *Phytochem Anal* 14:96-99
- Oliveira RR, Leitão GG, Moraes MCC et al (2005) Gradient elution for triterpene separation from *Cecropia lyratiloba* Miquel by HSCCC. *J Liq Chromatogr & Rel Technol* 28:12-13
- Osorio C, Duque C, Fujimoto F (1999) C₁₃-norisoprenoid glucoconjugates from Lulo (*Solanum quitoense* L.) leaves. *J Agric Food Chem* 47:1641-1645
- OuYang XK, Jin MC, He CH (2007) Preparative separation of four major alkaloids from medicinal plant of *Tripterygium wilfordii* Hook F using high-speed counter-current chromatography. *Sep Purif Technol* 56:319-324
- Oyourou JN, Combrinck S, Regnier T et al (2013) Purification, stability and antifungal activity of verbascoside from *Lippia javanica* and *Lantana camara* leaf extracts. *Ind Crops Prod* 43:820-826
- P.C.Inc. (1985) Counter current chromatography with Ito multi layer coil separator extractor. Pamphlet describing use of P.C.Inc instrument
- Paek JH, Lim SS (2014) Preparative isolation of aldose reductase inhibitory compounds from *Nardostachys chinensis* by elution-extrusion counter-current chromatography. *Arch Pharm Res* 10:1271-1279

- Pan S, Wang X, Duan W et al. (2014a) Preparative isolation and purification of flavonoids from *Cuscuta chinensis* Lam. by high-speed countercurrent chromatography. *J Liq Chromatogr & Rel Technol* 37:2162-2171
- Pan SB, Yu ZY, Wang X et al. (2014b) Preparative isolation and purification of flavonoids from the flower of *Chrysanthemum morifolium* Ramat. by high-speed counter-current chromatography. *Chem Ind Forest Prod* 34:17-22
- Peng A, Qu X, Li H et al (2010) Isolation and purification of flavones from *Murraya exotica* L. by high-speed counter-current chromatography. *Chin J Chromatogr* 28:383-387
- Peng A, Ye H, Li X et al (2009a) Preparative separation of capsaicin and dihydrocapsaicin from *Capsicum frutescens* by high-speed counter-current chromatography. *J Sep Sci* 32:2967-2973
- Peng A, Li R, Hu J et al (2008a) Flow rate gradient high-speed counter-current chromatography separation of five diterpenoids from *Triperygium wilfordii* and scale-up. *J Chromatogr A* 1200:129-135
- Peng C, Liang Y, Wang X et al (2009b) Preparative isolation and purification of flavonoids from the Chinese medicinal herb *Belamcanda* by high-speed countercurrent chromatography. *J Liq Chromatogr & Rel Technol* 32:2451-2461
- Peng J, Dong F, Qi Y et al (2008b) Preparative separation of four triterpene saponins from *Radix Astragali* by high-speed counter-current chromatography coupled with evaporative light scattering detection. *Phytochem Anal* 19:212-217
- Peng J, Fan G, Hong Z et al (2005e) Preparative separation of isovitexin and isoorientin from *Patrinia villosa* Juss by high-speed counter-current chromatography. *J Chromatogr A* 1074:111-115
- Peng J, Fan G, Qu L et al (2005d) Application of preparative high-speed counter-current chromatography for isolation and separation of schizandrin and gomisin A from *Schisandra chinensis*. *J Chromatogr A* 1082:203-207
- Peng J, Jiang Y, Fan G et al (2006b) Optimization suitable conditions for preparative isolation and separation of curculigoside and curculigoside B from *Curculigo orchoides* by high-speed counter-current chromatography. *Sep Purif Technol* 52:22-28
- Peng J, Zhan L, Dong F et al (2008c) A comparative study of chromatographic methods for separating chemical compounds from *Spiranthes australis* (R. Brown) Lindl roots. *Sep Purif Technol* 59:262-269
- Peng J, Dong F, Xu Q et al (2006a) Orthogonal test design for optimization of supercritical fluid extraction of daphnoretin, 7-methoxy-daphnoretin and 1,5-diphenyl-1-pentanone from *Stellera chamaejasme* L. and subsequent isolation by high-speed counter-current chromatography. *J Chromatogr A* 1135:151-157
- Peng J, Fan G, Chai Y et al (2006f) Efficient new method for extraction and isolation of three flavonoids from *Patrinia villosa* Juss. by supercritical fluid extraction and high-speed counter-current chromatography. *J Chromatogr A* 1102:44-50
- Peng J, Fan G, Wu Y (2005b) Isolation and purification of clemastanin B and indigoticoside A from *Radix Isatidis* by high-speed counter-current chromatography. *J Chromatogr A* 1091:89-93
- Peng J, Fan G, Wu Y (2006d) Preparative separation and isolation of three flavonoids and three phloroglucinol derivatives from *Hypericum japonicum* Thumb. using high-speed countercurrent chromatography by stepwise increasing the flow rate of the mobile phase. *J Liq chromatogr & Rel Technol* 29:1619-1632
- Peng J, Fan G, Wu Y et al (2005c) Isolation and separation isoorientin and isovitexin from *Patrinia Villosa* Juss by high speed counter-current chromatography. *Fenxi Huaxue* 33:1389-1392
- Peng J, Fan G., Wu Y (2006e) Preparative isolation of four new and two known flavonoids from the leaf of *Patrinia villosa* Juss. by counter-current chromatography and evaluation of their anticancer activities in vitro. *J Chromatogr A* 1115:103-111
- Peng J, Yang G, Fan G et al (2005a) Preparative isolation and separation of a novel and two known flavonoids from *Patrinia villosa* Juss by high-speed counter-current chromatography. *J Chromatogr A* 1092:235-240
- Peng JY, Fan GR, Wu YT (2006c) Isolation and separation of flavones from *Patrinia villosa* by high-speed counter-current chromatography. *Chin Pharm J* 41:977-979
- Peng Y, Xu LN, Han X et al (2007) Separation of two new prenylated dihydroflavonoids from *Dolichos tenuicaulis* (Baker) Craib by high-speed counter-current chromatography. *Chin J Anal Chem* 35:1444-1448
- Petit GR, Schaufelberger DE (1988) Isolation and structure of the cytostatic lignan glycoside phyllanthostatin A. *J Nat Prod* 51:1104-1112
- Petroski RJ, Powell RG, Clay K (1992) Alkaloids of *Stipa robusta* (Sleepygrass) infected with an *Acremonium endophyte*. *Nat Toxins* 1:84-88
- Pinel B, Audo G, Mallet S et al (2007) Multi-grams scale purification of xanthanolides from *Xanthium macrocarpum*. Centrifugal partition chromatography versus silica gel chromatography. *J Chromatogr A* 1151:14-19
- Puertas Mejia M, Hillebrand S, Stashenko E et al (2002) In vitro radical scavenging activity of essential oils from Columbian plants and fractions from oregano (*Origanum vulgare* L) essential oil. *Flav Fragr J* 17:380-384
- Putman LJ, Butler LG (1985) Fractionation of condensed tannins by counter-current chromatography. *J Chromatogr* 318:85-93
- Qi X, Ignatova S, Luo G et al (2010) Preparative isolation and purification of ginsenosides Rf, Re, Rd and Rb1 from the roots of *Panax ginseng* with a salt-containing solvent system and flow step-gradient by high performance counter-current chromatography coupled with an evaporative light scattering detector. *J Chromatogr A* 1217:1995-2001
- Qiao Q, Du Q (2011) Preparation of the monomers of gingerols and 6-shogaol by flash high speed counter-current chromatography. *J Chromatogr A* 1218:6187-6190
- Qing LH, Rui L, Xing WT et al. (2009) Isolation and purification of two constituents from *Dendrobium fimbriatum* hook by high-speed counter-current chromatography using stepwise elution. *Sep Sci Technol* 44: 1218-1227
- Qiu F, Luo J, Yao S et al (2009) Preparative isolation and purification of anthocyanins from purple sweet potato by high-speed counter-current chromatography. *J Sep Sci* 32:2146-2151

- Qiu H, Xiao X, Li G (2012) Separation and purification of furanocoumarins from *Toddalia asiatica* (L.) Lam. using microwave-assisted extraction coupled with high-speed counter-current chromatography. *J Sep Sci* 35:901-906
- Qiu YK, Yan X, Fang MJ et al. (2014) Two-dimensional countercurrent chromatography × high performance liquid chromatography for preparative isolation of toad venom. *J Chromatogr A* 1331:80-89
- Qu L, Peng J (2006) Single-step preparative isolation and separation of three flavonones from *Sophora flavescens* using high-speed countercurrent chromatography with stepwise increase in the mobile phase flow rate. *J Liq Chromatogr & Rel Technol* 29:913-924
- Qu L, Xin H, Su Y et al (2012) Combined application of macroporous resin and high speed counter-current chromatography for preparative separation of three flavonoid triglycosides from the leaves of *Actinidia valvata* Dunn. *J Sep Sci* 35:883-892
- Quan GH, Chin YW, Lee HK et al (2010) Preparative isolation and purification of deoxypodophyllotoxin from the rhizomes of *Anthriscus sylvestris* by high-speed counter-current chromatography. *J Korean Soc Appl Biol Chem* 53:110-113
- Quan GH, Oh SR, Song HH et al (2011) Preparative isolation of 8-methoxypsoralen from the rhizomes of *Pulsatilla chinensis* using high-speed counter-current chromatography. *J Korean Soc Appl Biol Chem* 54:623-627
- Queiroga CL, Cavalcante MQ, Ferraz PC et al. (2014) High-speed countercurrent chromatography as a tool to isolate nerolidol from the *Baccharis dracunculifolia* volatile oil. *J Essent Oil Res* 26:334-337
- Queiroz EF, Hay AE, Chaib F et al (2006) New and bioactive aromatic compounds from *Zanthoxylum zanthoxyloides*. *Planta Med* 72:746-750
- Quetin-Leclercq J, Angenot L, Dupont L et al (1988) Isolation and purification of panarine. An alkaloid from a *Venezuelan curare*. *Phytochemistry* 27:4002-4004
- Quetin-Leclercq J, Angenot L (1998) 10-hydroxy-Nb-methyl-corynantheol, a new quaternary alkaloid from the stem bark of *Strychnos usambarensis*. *Phytochemistry* 27:1923-1926
- Ramos AC, Neves FS, Vega MRG et al. (2014) Methodology for porphyrin isolation by high-performance countercurrent chromatography. *Nat Prod Commun* 9:841-842
- Reichelt KV, Hartmann B, Weber B et al (2010) Identification of bisprenylated benzoic acid derivatives from *Yerba Santa* (*Eriodictyon* ssp.) using sensory-guided fractionation. *J Agric Food Chem* 58:1850-1859
- Ren DB, Qin YH, Yun YH et al. (2014a) Separation of nine compounds from *Salvia plebeia* R.Br. using two-step high-speed counter-current chromatography with different elution modes. *J Sep Sci* 37:2118-2125
- Ren DB, Qin YH, Yun YH et al. (2014b) Using nonrandom two-liquid model for solvent system selection in counter-current chromatography. *J Chromatogr A* 1355:80-85
- Renault JH, Thepenier P, Zeches-Hanrot M et al (1995) Separation of the two major anthocyanins from champagne vintage by-products by gradient elution centrifugal partition chromatography. *J Liq Chromatogr & Rel Technol* 18:1663-1670
- Renault JH, Voutquenne L, Caron C et al. (2006) Purification of xanthohumol from *Humulus lupulus* by centrifugal partition chromatography using an original acetone based solvent scale. *J Liq Chromatogr & Rel Technol* 29:761-771
- Rinaldo D, Silva MA, Rodrigues CM et al (2006) Preparative separation of flavonoids from the medicinal plant *Davilla elliptica* St. Hill. by high-speed counter-current chromatography. *Quim Nova* 29:947-949
- Rocha GdG, Simões M, Lúcio KA et al (2007) Natural triterpenoids from *Cecropia lyratiloba* are cytotoxic to both sensitive and multidrug resistant leukemia cell lines. *Bioorg Med Chem* 15:7355-7360
- Rodrigues VF, Carmo HM, Oliveira RR et al (2009) Isolation of terpenoids from *Trichilia quadrijuga* (Meliaceae) by droplet counter-current chromatography. *Chromatographia* 70:1191-1195
- Rodríguez P, González-Mujica F, Bermúdez J et al (2010) Inhibition of glucose intestinal absorption by kaempferol 3-O- α -rhamnoside purified from *Bauhinia megalandra* leaves. *Fitoterapia* 81:1220-1223
- Roscher R, Winterhalter P (1993) 1,1,6-trimethyl-1,2-dihydronaphthalene (TDN) formation in wine. Application of multilayer coil countercurrent chromatography for the study of *Vitis vinifera* cv. Riesling leaf glycosides. *J Agric Food Chem* 41:1452-1457
- Ruan C, Xiao XH, Li GK (2014) Microwave-assisted extraction coupled with countercurrent chromatography for the rapid preparation of flavonoids from *Scutellaria barbata* D. Don. *J Sep Sci* 37:1364-1369
- Sannomiya M, Rodrigues CM, Coelho RG et al (2004) Application of preparative high speed counter current chromatography for the separation of flavonoids from the leaves of *Byrsonima crassa* Niedenzu. *J Chromatogr A* 1035:47-51
- Santos LC, Silva MA, Rodrigues CM et al (2005) Fast preparative separation of flavones from capitula of *Eriocaulon ligulatum* (Vell.) L.B.Smith (Eriocaulaceae) by high-speed countercurrent chromatography (HSCCC). *Rev Cienc Farm Basica Apl* 26:101-103
- Savitri Kumar N, Maduwantha B, Wijekoon WMA et al (2009) Separation of proanthocyanidins isolated from tea leaves using high-speed counter-current chromatography. *J Chromatogr A* 1216:4295-4302
- Scharbert S, Jezussek M, Hofmann T (2004) Evaluation of the taste contribution of theaflavins in black tea infusions using the taste activity concept. *Eur Food Res Technol* 218:442-447
- Schröder M, Lutz NL, Vetter W (2014) GC/MS and ¹H-NMR analysis of phytanic acid synthesized from natural trans-phytol and a synthetic phytol standard. *Chromatographia* 77:379-385
- Schwarz M, Hillebrand S, Habben S et al (2003a) Application of high speed countercurrent chromatography to the large scale isolation of anthocyanins. *Biochem Engin J* 14:179-189
- Schwarz M, Jerz G, Winterhalter P (2003b) Isolation and structure of Pinotin A, a new anthocyanin derivative from Pinotage wine. *Vitis* 42:105-106

- Schwarz M, Wray V, Winterhalter P (2004) Isolation and identification of novel pyranoanthocyanins from Black Carrot (*Daucus carota* L.) juice. *J Agric Food Chem* 52:5095-5101
- Severino VGP, Casal CdM, Forim MR et al (2009) Isolation of secondary metabolites from *Hortia oreadica* (Rutaceae) leaves through high-speed counter-current chromatography. *J Chromatogr A* 1216:4275-4281
- Shan T, Lu S, Luo C et al (2013) Preparative separation of spirobisnaphthalenes from endophytic fungus *Berkleasium* sp. Dzf12 by high-speed counter-current chromatography. *Molecules* 18:12896-12908
- Shan Y, Zhang W (2010) Preparative separation of major xanthenes from *Mangosteen pericarp* using high performance centrifugal partition chromatography. *J Sep Sci* 33:1274-1278
- Shehzad O, Jin Ha I et al (2011) Development of a rapid and convenient method to separate eight ginsenosides from *Panax ginseng* by high-speed counter-current chromatography coupled with evaporative light scattering detection. *J Sep Sci* 34:1116-1122
- Shehzad O, Khan S, Ha IJ et al (2013a) Application of stepwise gradients in counter-current chromatography: A rapid and economical strategy for the one-step separation of eight coumarins from *Seseli resinosum*. *J Chromatogr A* 1310:66-73
- Shehzad O, Kim HP, Kim YS (2013b) State-of-the-art separation of ginsenosides from Korean white and red ginseng by countercurrent chromatography. *Anal Bioanal Chem* 405:4523-4530
- Shehzad O, Khan S, Ha IJ et al (2012) Rational development of a selection model for solvent gradients in single-step separation of ginsenosides from *Panax ginseng* using high-speed counter-current chromatography. *J Sep Sci* 35:1462-1469
- Shen M, Xie M, Nie S et al (2008) Separation and identification of ergosta-4,6,8(14),22-tetraen-3-one from *Ganoderma atrum* by high-speed counter-current chromatography and spectroscopic methods. *Chromatographia* 67:999-1001
- Shi J, Hu R, Lu Y et al (2009a) Single-step purification of dracorhodin from dragon's blood resin of *Daemonorops draco* using high-speed counter-current chromatography combined with pH modulation. *J Sep Sci* 32:4040-4047
- Shi J, Li G, Wang H et al (2011) One-step separation of three flavonoids from *Poa cynosuroides* by high-speed counter-current chromatography. *Phytochem Anal* 22:450-454
- Shi S, Huang K, Zhang Y et al (2007a) Purification and identification of antiviral components from *Laggera pterodonta* by high-speed counter-current chromatography. *J Chromatogr B* 859:119-124
- Shi S, Huang K, Zhang Y et al (2008d) Preparative isolation and purification of two flavonoid glycosides from *Taraxacum mongolicum* by high-speed counter-current chromatography. *Sep Purif Technol* 60:81-85
- Shi S, Jiang D, Zhao M et al (2007b) Preparative isolation and purification of triterpene saponins from *Clematis mandshurica* by high-speed counter-current chromatography coupled with evaporative light scattering detection. *J Chromatogr B* 852:679-683
- Shi S, Zhang Y, Huang K et al (2008c) Application of preparative high-speed counter-current chromatography for separation and purification of lignans from *Taraxacum mongolicum*. *Food Chem* 108:402-406
- Shi S, Zhang Y, Zhao Y et al (2008e) Preparative isolation and purification of three flavonoid glycosides from *Taraxacum mongolicum* by high-speed counter-current chromatography. *J Sep Sci* 31:683-688
- Shi S, Zhou H, Zhang Y et al (2009b) A High-speed counter-current chromatography- HPLC-DAD method for preparative isolation and purification of two polymethoxylated flavones from *Taraxacum mongolicum*. *J Chromatogr Sci* 47:349-353
- Shi S, Zhou H, Zhang Y et al (2008b) Hyphenated HSCCC-DPPH• for rapid preparative isolation and screening of antioxidants from *Selaginella moellendorffii*. *Chromatographia* 68:173-178
- Shi SY, Zhou HH, Huang KL et al (2008a) Application of high-speed counter-current chromatography for the isolation of antiviral eremophilanolides from *Ligularia atroviolacea*. *Biomed Chromatogr* 22:985-991
- Shi X, Wang X, Wang D et al (2009c) Separation and purification of α -cyperone from *Cyperus rotundus* with supercritical fluid extraction and high-speed counter-current chromatography. *Sep Sci Technol* 44:712-721
- Shibusawa Y, Hagiwara Y, Chao Z et al (1997) Application of high-speed countercurrent chromatography to the separation of coumarin and related compounds. *J Chromatogr A* 759:47-53
- Shibusawa Y, Yanagida A, Isozaki M et al (2001) Separation of apple procyanidins into different degrees of polymerization by high-speed counter-current chromatography. *J Chromatogr* 915:253-257
- Shibusawa Y, Yanagida A, Shindo H et al (2003) Separation of apple oligomers by CCC. *J Liq Chromatogr & Rel Technol* 26:1690-1621
- Shikanga EA, Viljoen A, Combrinck S et al (2011) Isolation of *Sceletium* alkaloids by high-speed countercurrent chromatography. *Phytochem Lett* 4:190-193
- Shinomiya K, Kabasawa Y, Ito Y (1999) Countercurrent chromatographic separation of sugars and p-nitrophenyl derivatives by cross axis coil planet centrifuge. *J Liq Chromatogr & Rel Technol* 22:579-592
- Shinomiya K, Kabasawa Y, Ito Y (2001) Countercurrent chromatographic separation of biotic dicarboxylic acids with polar two phase solvent systems using cross axis coil planet centrifuge. *J Liq Chromatogr & Rel Technol* 24:2625-2634
- Shinomiya K, Kabasawa Y, Nakazawa H et al. (2003) Countercurrent chromatographic separation of soybean isoflavones by two different types of coil planet centrifuges with various two phase solvent system. *J Liq Chromatogr & Rel Technol* 26:3497-3509
- Shirota O, Nagamatsu K, Sekita S (2007) Simple preparative isolation of salvininolone A from the hallucinogenic sage, *Salvia divinorum*, by centrifugal partition chromatography. *J Liq Chromatogr & Rel Technol* 30:1105-1114

- Shirota O, Nagamatsu K, Sekita S et al (2008) Preparative separation of the saponin lancemaside A from *Codonopsis lanceolata* by centrifugal partition chromatography. *Phytochem Anal* 19:403-410
- Shu X, Duan W, Liu F et al. (2014b) Preparative separation of polyphenols from the flowers of *Paeonia lactiflora* Pall. by high-speed counter-current chromatography. *J Chromatogr B* 947-948:62-67
- Shu X, Wang X, Yu J et al. (2014a) Preparative isolation of seven diterpenoid alkaloids from *Aconitum coreanum* by pH-zone-refining counter-current chromatography. *Molecules* 19:12619-12629
- Shu XK, Li J, Liu F et al (2013) Accelerated solvent extraction and pH-zone-refining counter-current chromatographic purification of yunaconitine and 8-deacetylyunaconitine from *Aconitum vilmorinianum* Kom. *J Sep Sci* 36:2680-2685
- Si W, Gong J, Tsao R et al (2006) Bioassay-guided purification and identification of antimicrobial components in Chinese green tea extract. *J Chromatogr A* 1125:204-210
- Sieniawska E, Skalicka-Woźniak K (2014) Isolation of chlorogenic acid from *Mutellina purpurea* L. herb using high-performance counter-current chromatography. *Nat Prod Res* 28:1936-1939
- Silva JCT, Jham GN, Oliveira RDL et al (2007) Purification of the seven tetranortriterpenoids in neem (*Azadirachta indica*) seed by counter-current chromatography sequentially followed by isocratic preparative reversed-phase high-performance liquid chromatography. *J Chromatogr A* 1151:203-210
- Simirgiotis M.J, Schmeda-Hirschmann G, Bórquez J et al (2013) The *Passiflora tripartita* (banana passion) fruit: A source of bioactive flavonoid C-glycosides isolated by HSCCC and characterized by HPLC-DAD-ESI/MS/MS. *Molecules* 18:1672-1692
- Skalicka-Woźniak K, Mroczek T, Garrard I et al (2009) Isolation of the new minor constituents dihydropyranochromone and furanocoumarin from fruits of *Peucedanum alsaticum* L. by high-speed counter-current chromatography. *J Chromatogr A* 1216:5669-5675
- Skalicka-Woźniak K, Walasek M, Ludwiczuk A et al (2013) Isolation of terpenoids from *Pimpinella anisum* essential oil by high-performance counter-current chromatography. *J Sep Sci* 36:2611-2614
- Skalicka-Woźniak K, Mroczek T, Garrard I et al (2012) Isolation of the minor and rare constituents from fruits of *Peucedanum alsaticum* L. using high-performance counter-current chromatography. *J Sep Sci* 35:790-797
- Skalicka-Woźniak K, Walasek M (2014) Preparative separation of menthol and pulegone from peppermint oil (*Mentha piperita* L.) by high-performance counter-current chromatography. *Phytochem Lett* 10:94-98
- Skalicka-Woźniak K, Zagaja M, Głowniak K et al. (2014) Purification and anticonvulsant activity of xanthotoxin (8-methoxy psoralen). *Cent Europ J Biol* 9:431-436
- Slacanin I, Marston A, Hostettmann K (1989) Modifications to a high speed counter current chromatograph for improved separation capability. *J Chromatogr* 482:234-239
- Slacanin I, Marston A, Hostettmann et al (1991) The isolation of *Eleutherococcus senticosus* constituents by centrifugal partition chromatography and their quantitative determination by high performance liquid chromatography. *Phytochem Anal* 2:137-142
- Slimestadt R, Marston A, Hostettmann K (1996) Preparative separation of phenolic compounds from *Picea abies* by high-speed counter-current chromatography. *J Chromatogr A* 719:438-443
- Smelcerovic A, Laatsch H, Lepojevic Z et al (2002) The separation of hypericine and pseudohypericine from *Hypericum perforatum* L. *Pharmazie* 57:178-180
- Sousa AL, Sales QS, Braz-Filho R et al (2012) Lignans and flavonoids isolated from *Cuscuta racemosa* Mart. & Humb (Convolvulaceae) by droplet counter-current chromatography. *J Liq Chromatogr & Rel Technol* 35:2294-2303
- Stingl C, Knapp H, Winterhalter P (2002) 3,4-dihydroxy-7,8-dihydro-beta-ionone-3-O-beta-D-glucopyranoside and other glycosidic constituents from apple leaves. *Nat Prod Lett* 16:87-93
- Su YP, Shen J, Xu Y et al (2011) Preparative separation of alkaloids from *Gelsemium elegans* Benth. using pH-zone-refining counter-current chromatography. *J Chromatogr A* 1218:3695-3698
- Su Z, Wu H, Aisa HA et al (2008) Preparative isolation of guaipyridine sesquiterpene alkaloid from *Artemisia rupestris* L. flowers using high-speed counter-current chromatography. *J Sep Sci* 31:2161-2166
- Sumthong P, Damveld RA, Choi YH et al (2006) Activity of quinones from teak (*Tectona grandis*) on fungal cell wall stress. *Planta Med* 72:943-944
- Sun A, Feng L, Liu R (2006b) Preparative isolation and purification of prim-O-glucosyl-cinnifugin and 4'-O-β-D-glucosyl-5-O-methylvisaminol from *Radix Saposhnikoviae* by high speed countercurrent chromatography. *J Liq Chromatogr & Rel Technol* 29:751-759
- Sun A, Sun Q, Liu R (2006a) Isolation and purification of baicalein and chrysin from the extracts of *Oroxylum indicum* by high speed counter-current chromatography. *Chin J Anal Chem* 34:S243-S246
- Sun A, Zhang Y, Li A et al (2011c) Extraction and preparative purification of tanshinones from *Salvia miltiorrhiza* Bunge by high-speed counter-current chromatography. *J Chromatogr B* 879:1899-1904
- Sun A, Feng L, Liu R (2005) Preparative isolation and purification of honokiol and magnolol from *Magnolia officinalis* Rehd. et Wils by high-speed countercurrent chromatography. *Fenxi Huaxue* 33:1016-1018
- Sun A, Sun Q, Liu R (2007) Preparative isolation and purification of flavone compounds from *Sophora japonica* L. by high-speed counter-current chromatography combined with macroporous resin column separation. *J Sep Sci* 30:1013-1018
- Sun C, Zheng Y, Chen Q et al (2012) Purification and anti-tumour activity of cyanidin-3-O-glucoside from Chinese bayberry fruit. *Food Chem* 131:1287-1294

- Sun Q, Sun A, Liu R (2006c) Preparative isolation and purification of four compounds from the Chinese medicinal herb *Rhizoma Anemarrhenae* by high-speed counter-current chromatography. *J Chromatogr A* 1104:69-74
- Sun Y, Li W, Wang J (2011d) Ionic liquid based ultrasonic assisted extraction of isoflavones from *Iris tectorum* Maxim and subsequently separation and purification by high-speed counter-current chromatography. *J Chromatogr B* 879:975-980
- Sun Y, Lin H, Wang J et al (2011b) An application of high-speed counter-current chromatography for separation and purification of bungeiside-A, bungeiside-B and baishouwubenzophenone from *Cynanchum bungei* Decne. *Phytochem Anal* 22:526-531
- Sun Y, Liu Z, Wang J et al (2009a) Separation and purification of baishouwubenzophenone, 4-hydroxyacetophenone and 2,4-dihydroxyacetophenone from *Cynanchum auriculatum* Royle ex Wight by HSCCC. *Chromatographia* 70:1-6
- Sun Y, Liu Z, Wang J et al (2009c) Preparative isolation and purification of flavones from *Pericarpium Citri reticulatae* by high-speed counter-current chromatography. *Chin J Chromatogr* 27:244-247
- Sun Y, Liu Z, Wang J et al (2008) Supercritical fluid extraction of paeonol from *Cynanchum paniculatum* (Bge.) Kitag. and subsequent isolation by high-speed counter-current chromatography coupled with high-performance liquid chromatography-photodiode array detector. *Sep Purif Technol* 64:221-226
- Sun Y, Yu Z, Duan W et al (2011a) Isolation and purification of seven lignans from *Magnolia sprengeri* by high-speed counter-current chromatography. *J Chromatogr B* 879:3775-3779
- Sun Y, Zhu H, Wang J et al (2009b) Isolation and purification of salvianolic acid A and salvianolic acid B from *Salvia miltiorrhiza* by high-speed counter-current chromatography and comparison of their antioxidant activity. *J Chromatogr B* 877:733-737
- Sun Y, Gu S, Guo L et al. (2014c) Preparative separation of five flavones from flowers of *Polygonum cuspidatum* by high-speed countercurrent chromatography. *J Sep Sci* 37:1703-1709
- Sun Y, Lin H, Liu Z et al. (2014b) Preparative separation of minor bioactive compounds from flower of *P. cuspidatum* by high-speed counter-current chromatography and comparison of their antioxidant activity. *Sep Purif Technol* 134:171-177
- Sun Y, Sun Y, Chen H et al. (2014a) Isolation of two new prenylated flavonoids from *Sinopodophyllum emodi* fruit by silica gel column and high-speed counter-current chromatography. *J Chromatogr B* 969:190-198
- Sutherland IA, Brown L, Forbes S et al (1998) Countercurrent chromatography (CCC) and its versatile application as an industrial purification & production process. *J Liq Chromatogr & Rel Technol* 21:279-298
- Sutherland IA, Brown L, Forbes S et al (1998) Countercurrent chromatography (CCC) and its versatile application as an industrial purification and production process. *J Liq Chromatogr & Rel Technol* 21:279-298
- Szakiel A, Voutquenne-Nazabadioko L, Henry M (2011) Isolation and biological activities of lyoniside from rhizomes and stems of *Vaccinium myrtillus*. *Phytochem Lett* 4:138-143
- Tang Q, Wang Y, Chen M et al (2013) Application of high-speed counter-current chromatography preparative separation of flavone C-glycosides from *Lophatherum gracile*. *Sep Sci Technol* 48:1906-1912
- Tang Q, Yang C, Chen F et al (2011) Separation and purification of bioactive flavonol glycosides from *Hedyotis diffusa* Willd by high-speed counter-current chromatography. *Sep Sci Technol* 46:1184-1188
- Tang Q, Yang C, Ye W et al (2008b) Preparative isolation and purification of chemical components from *Aconitum Coreanum* by high-speed counter-current chromatography coupled with evaporative light scattering detection. *Phytochem Anal* 19:155-159
- Tang Q, Liu J, Xue J et al (2008a) Preparative isolation and purification of two new isomeric diterpenoid alkaloids from *Aconitum coreanum* by high-speed counter-current chromatography. *J Chromatogr B* 872:181-185
- Tang Q, Yang C, Ye W et al (2007) Preparative isolation and purification of bioactive constituents from *Aconitum coreanum* by high-speed counter-current chromatography coupled with evaporative light scattering detection. *J Chromatogr A* 1144:203-207
- Tang S, Song H, Liu E et al. (2014) Isolation and purification of gingerols from ginger by high-speed counter-current chromatography. *Asian J Chem* 26:3331-3334
- Thakur M, Jerz G, Tuwalska D et al. (2014) High-speed countercurrent chromatographic recovery and off-line electrospray ionization mass spectrometry profiling of bisdesmodic saponins from *Saponaria officinalis* possessing synergistic toxicity enhancing properties on targeted antitumor toxins. *J Chromatogr B* 955-956:1-9
- Thiebaut D, Rosset R (1993) Modern countercurrent chromatography. *LC GC Int* 6:154-162
- Tian G, Zhang T, Yang F et al (2000a) Separation of gallic acid from *Cornus officinalis* Sieb. et Zucc by high-speed countercurrent chromatography. *J Chromatogr A* 886:309-312
- Tian G, Zhang T, Zhang Y et al. (2002) Separation of tanshinones from *Salvia miltiorrhiza* Bunge by multidimensional counter current chromatography. *J Chromatogr A* 945:281-285
- Tian G, Zhang Y, Zhang T et al (2000b) Separation of tanshinones from *Salvia miltiorrhiza* Bunge by high-speed counter-current chromatography using stepwise elution. *J Chromatogr* 904:107-111
- Tian G, Zhang U, Zhang T et al (2004) Separation of flavonoids from the seeds of *Vernonia anthelmintica* Wild by high speed counter current chromatography. *J Chromatogr A* 1049:219-222
- Tian J, Ye X, Shang Y et al (2012) Preparative isolation and purification of harpagoside and angroside C from the root of *Scrophularia ningpoensis* Hemsley by high-speed counter-current chromatography. *J Sep Sci* 35:2659-2664
- Tong S, Sheng L, Yan J et al (2009b) Preparative separation of phenylpropanoid glycoside from *Scrophularia ningpoensis* Hemsley by high speed countercurrent chromatography and ESI-MSn analysis. *J Liq Chromatogr & Rel Technol* 32:2322-2333

- Tong S, Yan J, Chen G et al (2009a) Purification of rutin and nicotiflorin from the flowers of *Edgeworthia chrysantha* Lindl. by high-speed counter-current chromatography. *J Chromatogr Sci* 47:341-344
- Tong S, Yan J, Guan YX (2008) Preparative separation of isomeric caffeoylquinic acids from Flos *Lonicerae* by pH-zone-refining counter-current chromatography. *J Chromatogr A* 1212:48-53
- Tong S, Yan J, Lou J (2006) Preparative isolation and purification of harpagoside from *Scrophularia ningpoensis* Hemsley by high-speed counter-current chromatography. *Phytochem Anal* 17:406-408
- Tong S, Yu Q, Li XN et al (2013) Preparative separation of tertiary alkaloids from *Corydalis yanhusuo* W. T. Wang by pH-zone-refining counter-current chromatography. *J Liq Chromatogr & Rel Technol* 36:229-238
- Tong S, Yan J (2007) Large-scale separation of hydroxyanthraquinones from *Rheum palmatum* L. by pH-zone-refining counter-current chromatography. *J Chromatogr A* 1176:163-168
- Tong S, Yan J, Lou J (2005) Preparative isolation and purification of alkaloids from *Corydalis yanhusuo* W. T. Wang by high speed counter-current chromatography. *J Liq Chromatogr & Rel Technol* 28:2979-2989
- Tong X, Xiao X, Li G (2011) On-line coupling of dynamic microwave-assisted extraction with high-speed counter-current chromatography for continuous isolation of nevadensin from *Lycirotus pauciflorus* Maxim. *J Chromatogr B* 879:2397-2402
- Tong X, Zhou T, Xiao X et al (2012) A consecutive preparation method based upon accelerated solvent extraction and high-speed counter-current chromatography for isolation of aesculin from *Cortex fraxinus*. *J Sep Sci* 35:3609-3614
- Toribio A, Delannay E, Richard B et al (2007b) Preparative isolation of huperzines A and B from *Huperzia serrata* by displacement centrifugal partition chromatography. *J Chromatogr A* 1140:101-106
- Toribio A, Destandau E, Elfakir C et al (2009) Hyphenation of centrifugal partition chromatography with electrospray ionization mass spectrometry using an active flow-splitter device for characterization of flavonol glycosides. *Rapid Commun Mass Spectr* 23:1863-1870
- Toribio A, Nuzillard JM, Renault JH (2007a) Strong ion-exchange centrifugal partition chromatography as an efficient method for the large-scale purification of glucosinolates. *J Chromatogr A* 1170:44-51
- Toribio A, Bonfils A, Delannay E et al (2006) Novel seco-dibenzopyrrocoline alkaloid from *Cryptocarya oubatchensis*. *Organic Lett* 8:3825-3828
- Torskangerpoll K, Chou E, Andersen OM (2001) Separation of acylated anthocyanin pigments by high speed CCC. *J Liq Chromatogr & Rel Technol* 24:1791-1799
- Trabelsi N, Oueslati S, Ksouri R et al (2014) The antioxidant properties of new dimer and two monomers of phenolic acid amides isolated from *Limoniastrum guyonianum*. *Food Chem* 146:466-471
- Tsao R, Yang R (2006) Lutein in selected Canadian crops and agri-food processing by-products and purification by high-speed counter-current chromatography. *J Chromatogr A* 1112:202-208
- Uppugundla N, Engelberth A, Ravindranath SV et al (2009) Switchgrass water extracts: extraction, separation and biological activity of rutin and quercitrin. *J Agric Food Chem* 57:7763-7770
- Urbain A, Corbeiller P, Aligiannis N et al (2010) Hydrostatic countercurrent chromatography and ultra high pressure LC: Two fast complementary separation methods for the preparative isolation and the analysis of the fragrant massoia lactones. *J Sep Sci* 33:1198-1203
- Urbain A, Marston A, Sintra Grilo L et al (2008) Xanthenes from *Gentianella amarella* ssp. *acuta* with acetylcholinesterase and monoamine oxidase inhibitory activities. *J Nat Prod* 71:895-897
- Urbain A, Marston A, Hostettmann K (2005) Coumarins from *Peucedanum ostruthium* as inhibitors of acetylcholinesterase. *Pharm Biol* 43:647-650
- VanHaelen M, VanHaelen-Fastre R (1988) Countercurrent chromatography for isolation of flavonol glycosides from *Ginkgo biloba* leaves. *J Liq Chromatogr* 11:2969-2975
- Vanhaelen-Fastre R, Diallo B, Jaziri M et al (1992) High-speed countercurrent chromatography separation of taxol and related diterpenoids from *Taxus baccata*. *J Liq Chromatogr & Rel Technol* 15:697-706
- Vidal S, Hayasaka Y, Meudec E et al (2004) Fractionation of grape anthocyanin classes using multilayer coil countercurrent chromatography with step gradient elution. *J Agric Food Chem* 52:713-719
- Viron C, Lhermite S, Andre P et al (1998) Isolation of phenylpropanoid glycosides from *Orobancha rapum* by high-speed countercurrent chromatography. *Phytochem Anal* 9:39-43
- Vougogiannopoulou K, Fokialakis N, Aligiannis N et al (2011) Simple indole alkaloids from the neotropical rutaceous tree *Raputia simulans*. *Planta Med* 77:1559-1561
- Wang C, Pan Y, Fan G (2010e) Application of an efficient strategy based on MAE, HPLC-DAD-MS/MS and HSCCC for the rapid extraction, identification, separation and purification of flavonoids from Fructus *Aurantii Immaturus*. *Biomed Chromatogr* 24:235-244
- Wang C, Chao Z, Sun W et al. (2014a) Isolation of five glycosides from the barks of *Ilex rotunda* by high-speed counter-current chromatography. *J Liq Chromatogr & Rel Technol* 37:2363-2376
- Wang D, Fang L, Wang X et al (2011d) Preparative separation and purification of sesquiterpenoids from *Tussilago farfara* L. by high-speed counter-current chromatography. *Quim Nova* 34:804-807
- Wang D, Geng Y, Fang L et al (2011b) An efficient combination of supercritical fluid extraction and high-speed counter-current chromatography to extract and purify (E)- and (Z)-diastereomers of α -asarone and β -asarone from *Acorus tatarinowii* Schott. *J Sep Sci* 34:3339-3343
- Wang D, Bai A, Lin X et al (2012b) Efficient method for extraction and isolation of shionone from *Aster tataricus* L. F. by supercritical fluid extraction and high-speed counter-current chromatography. *Acta Chromatogr* 24:615-625

- Wang G, Wang C, Zhang B et al (2013e) Rapid separation of flavonoids from hydrolysis products of *Epimedium koreanum*. J Liq Chromatogr & Rel Technol 36:1163-1176
- Wang J, Bai HL, Liu CM et al (2010d) Isolation and purification of ginsenosides from plant extract of *Panax quinquefolium* L. by high performance centrifugal partition chromatography coupled with ELSD. Chromatographia 71:267-271
- Wang J, Gao H, Zhao J et al (2010a) Preparative separation of phenolic compounds from *Halimodendron halodendron* by high-speed counter-current chromatography. Molecules 15:5998-6007
- Wang J, Liu CM, Li L et al (2011g) Isolation of four high-purity dammarane saponins from extract of *Panax notoginseng* by centrifugal partition chromatography coupled with evaporative light scattering detection in one operations. Phytochem Anal 22:263-267
- Wang J, Yu J, Li L et al (2013g) Isolation of high purity ginsenosides from plant extract of *Panax ginseng* by high performance centrifugal partition chromatography coupled with evaporative light scattering detection. J Liq Chromatogr & Rel Technol 36:583-590
- Wang K, Liu Z, Huang JA et al (2008c) Preparative isolation and purification of theaflavins and catechins by high-speed countercurrent chromatography. J Chromatogr B 867:282-286
- Wang P, Liu Y, Chen T et al (2013b) One-step separation and purification of three lignans and one flavonol from *Sinopodophyllum emodi* by medium-pressure liquid chromatography and high-speed counter-current chromatography. Phytochem Anal 24:603-607
- Wang Q, Cheng XL, Li H et al (2013d) Application of an efficient strategy for discovery and purification of bioactive compounds from Chinese herbal medicines, a case study on the *Puerariae thomsonii* Flos. J Pharm Biomed Anal 75:25-32
- Wang QE, Lee FSC, Wang K (2004b) Isolation and purification of inflacoumarin A and licochalcone A from licorice by high speed countercurrent chromatography. J Chromatogr A 1048:51-57
- Wang R, Lin X, Lu Y (2013f) Effective counter-current chromatographic method for one-step preparative isolation and purification of anthraglycoside b from *Begonia fimbristipula* using elution-extrusion separation mode. J Liq Chromatogr & Rel Technol 36:363-371
- Wang R, Zhu X, Sun A et al. (2014b) Preparative isolation of baicalin and wogonoside from *Scutellariae Radix* by high speed countercurrent chromatography by using ionic liquids as the modifier of two-phase solvent system. J Liq Chromatogr & Rel Technol 37:2275-2286
- Wang S, Xie J, Yang W et al (2011c) Preparative separation and purification of alkylamides from *Zanthoxylum bungeanum* Maxim by high-speed counter-current chromatography. J Liq Chromatogr & Rel Technol 34:2640-2652
- Wang X, Cheng C, Sun Q et al (2005b) Isolation and purification of four flavonoid constituents from the flowers of *Paeonia suffruticosa* by high-speed counter-current chromatography. J Chromatogr A 1075:127-131
- Wang X, Dong H, Yang B et al (2011a) Preparative isolation of alkaloids from *Dactylicapnos scandens* using pH-zone-refining counter-current chromatography by changing the length of the separation column. J Chromatogr B 879:3767-3770
- Wang X, Dong H, Yang B et al (2013c) Large-scale separation of strychnine and brucine from *Strychnos nux-vomica* L. by pH-zone-refining counter-current chromatography. J Liq Chromatogr & Rel Technol 36:648-657
- Wang X, Geng Y, Li F et al (2007a) Large-scale separation of salvianolic acid B from the Chinese medicinal plant *Salvia miltiorrhiza* by pH-zone-refining countercurrent chromatography. J Sep Sci 30:3214-3217
- Wang X, Geng Y, Wang D et al (2008b) Separation and purification of harmine and harmaline from *Peganum harmala* using pH-zone-refining counter-current chromatography. J Sep Sci 31:3543-3547
- Wang X, Liang Y, Peng C et al (2011f) Preparative isolation and purification of chemical constituents of *Belamcanda* by MPLC, HSCCC, and PREP-HPLC. J Liq Chromatogr & Rel Technol 34:241-257
- Wang X, Liang Y, Zhu L et al (2010c) Preparative isolation and purification of flavone C-glycosides from the leaves of *Ficus microcarpa* L.f by medium-pressure liquid chromatography, high-speed countercurrent chromatography, and preparative liquid chromatography. J Liq Chromatogr & Rel Technol 33:462-480
- Wang X, Liu J, Geng Y et al (2010b) Preparative separation of alkaloids from *Nelumbo nucifera* Gaertn by pH-zone-refining counter-current chromatography. J Sep Sci 33:539-544
- Wang X, Shi X, Li F et al (2008d) Application of analytical and preparative high-speed counter-current chromatography for the separation of Z-ligustilide from a crude extract of *Angelica sinensis*. Phytochem Anal 19:93-197
- Wang X, Wang Y, Geng Y, Li F, Zhang C (2004a) Isolation and purification of honokiol and magnolol from cortex *Magnoliae officinalis* by high speed counter current chromatography. J Chromatography A 1036:171-175
- Wang X, Wang Y, Yuan J (2004c) An efficient new method for extraction, separation and purification of psoralen and isopsoralen from *Fructus Psoraleae* by supercritical fluid extraction and high speed counter current chromatography. J Chromatogr A 1055:135-140
- Wang X, Zheng Z, Guo X et al (2011e) Preparative separation of gingerols from *Zingiber officinale* by high-speed counter-current chromatography using stepwise elution. Food Chem 125:1476-1480
- Wang X, Dong H, Shu X et al (2012a) Large-scale separation of alkaloids from *Corydalis bungeana* Turcz. by pH-zone-refining counter-current chromatography. Molecules 17:14968-14974
- Wang X, Geng Y, Li F et al (2006a) Large-scale separation of alkaloids from *Corydalis decumbens* by pH-zone-refining counter-current chromatography. J Chromatogr A 1115:267-270
- Wang X, Geng Y, Li F et al (2006b) Preparative separation of cichoric acid from *Echinacea purpurea* by pH-zone-refining counter-current chromatography. J Chromatogr A 1103:166-169

- Wang X, Li F, Sun Q et al (2005c) Application of preparative high-speed counter-current chromatography for separation and purification of arctiin from *Fructus Arctii*. J Chromatogr A 1063:247-251
- Wang X, Li F, Zhang H et al (2005a) Preparative isolation and purification of polymethoxylated flavones from *Tangerine* peel using high-speed counter-current chromatography. J Chromatogr A 1090:188-192
- Wang X, Wang H, Ding C et al (2012c) One-step preparative separation of two polyhydroxystilbenes from *Rheum likiangense* Sam. by high-speed counter-current chromatography. Phytochem Anal 23:684-688
- Wang Y, Guan SH, Feng RH et al (2013a) Elution-extrusion counter-current chromatography separation of two new benzyl ester glucosides and three other high-polarity compounds from the tubers of *Pleione bulbocodioides*. Phytochem Anal 24:671-676
- Wang Y, Liu B (2007) Preparative isolation and purification of dicaffeoylquinic acids from the *Ainsliaea fragrans* champ by high-speed counter-current chromatography. Phytochem Anal 18:436-440
- Wang Y, Liu M, Zheng L et al (2012d) Preparative purification of five bioactive components from *Agrimonia pilosa* Ledeb by high-speed counter-current chromatography. J Sep Sci 35:1977-1984
- Wang YY, Wang YP, Liu JY et al (2007b) Preparative separation of gentiopicrin from *Gentiana scabra* bunge by high speed counter current chromatography. J Chin Med Mat 30:789-791
- Wang Z, Wang J, Sun Y et al (2008a) Purification of caffeic acid, chlorogenic acid and luteolin from *Caulis Lonicerae* by high-speed counter-current chromatography. Sep Purif Technol 63:721-724
- Wei J, Zhang T, Ito Y (2005) Preparative separation of triptolidide from Chinese traditional herb by multidimensional CCC. J Liq Chromatogr & Rel Technol 28:1903-1911
- Wei Y, Gao Y, Xie Q et al (2011d) Isolation of chlorogenic acid from *Flaveria bidentis* (L.) Kuntze by CCC and synthesis of chlorogenic acid-intercalated layered double hydroxide. Chromatographia 73:97-102
- Wei Y, Gao Y, Zhang K et al (2010) Isolation of caffeic acid from *Eupatorium adenophorum* spreng by high-speed countercurrent chromatography and synthesis of caffeic acid-intercalated layered double hydroxide. J Liq Chromatogr & Rel Technol 33:837-845
- Wei Y, Hu J, Li H et al (2011a) Preparative isolation and purification of senkyunolide-I, senkyunolide-H and ferulic acid from *Rhizoma Chuanxiong* using counter-current chromatography. J Sep Sci 34: 3426-3432
- Wei Y, Huang W, Gu Y (2013) Online isolation and purification of four phthalide compounds from *Chuanxiong rhizoma* using high-speed counter-current chromatography coupled with semi-preparative liquid chromatography. J Chromatogr A 1284:53-58
- Wei Y, Sardar MR, Sutherland IA et al (2011c) Separation of delphinidin-3-o-sambubioside, cyanidin-3-o-sambubioside and p-coumaric acid from cranberry by CCC followed by prep-HPLC using robotic CCC solvent system selection. Chromatographia 74:367-373
- Wei Y, Xie Q, Dong W et al (2009b) Separation of epigallocatechin and flavonoids from *Hypericum perforatum* L. by high-speed counter-current chromatography and preparative high-performance liquid chromatography. J Chromatogr A 1216:4313-4318
- Wei Y, Xie Q, Fisher D et al. (2009c) Preparative isolation of imperatorin, oxypeucedanin and isoimperatorin from a traditional chinese herb using a HSCCC strategy based on optimization of rapid flow rate. Chromatographia 70:1185-1189
- Wei Y, Xie Q, Fisher D et al. (2011e) Separation of patuletin-3-O-glucoside, astragalin, quercetin, kaempferol and isorhamnetin from *Flaveria bidentis* (L.) Kuntze by elution-pump-out high-performance counter-current chromatography. J Chromatogr A 1218:6206-6211
- Wei Y, Xie Q, Ito Y (2008) Preparative isolation of kaempferol pyranosides from a traditional Chinese herb using high speed countercurrent chromatography. J Liq Chromatogr & Rel Technol 31:443-451
- Wei Y, Xie Q, Ito Y (2009a) Preparative separation of taxifolin-3-glucoside, hyperoside and amygdalin from plant extracts by high speed countercurrent chromatography. J Liq Chromatogr & Rel Technol 32:1010-1022
- Wei Y, Zhang K, Zhang G et al (2011b) Isolation of five bioactive components from *Eupatorium adenophorum* Spreng using stepwise elution by high-speed countercurrent chromatography. J Liq Chromatogr & Rel Technol 34: 2505-2515
- Wei Y, Zhang T, Ito Y (2003b) Preparative separation of rhein from Chinese traditional herb by repeated high speed counter current chromatography. J Chromatogr A 1017:125-130
- Wei Y, Zhang T, Ito Y (2004) Preparative isolation of osthol and xanthotoxol from *Common Cnidium Fruit* (Chinese traditional herb) using stepwise elution by high speed counter current chromatography. J Chromatogr A 1033:373-377
- Wei Y, Zhang T, Xu G et al (2001) Application of analytical and preparative high-speed countercurrent chromatography for separation of lycopene from crude extract of tomato paste. J Chromatogr A 929:169-173
- Wei Y, Zhang T, Xu G et al (2003a) Application of CCC for the separation of lutein from a crude extract of marigold flower petals. J Liq Chromatogr & Rel Technol 26:1659-1669
- Wei Y, Zhang TY, Wu KY (2002) Separation of eleutheraside E from crude extract of *Radix Acanthopanax senticosus* by analytical and preparative high speed countercurrent chromatography. Chin J Chromatogr 20:543-545
- Wei Y, Du J, Lu Y (2012a) Preparative separation of bioactive compounds from essential oil of *Flaveria bidentis* (L.) Kuntze using steam distillation extraction and one step high-speed counter-current chromatography. J Sep Sci 35:2608-2614
- Wei Y, Ito Y (2006) Isolation of imperatorin, oxypeucedanin, and isoimperatorin from *Angelica dahurica* (Fisch. ex Hoffm) Benth. et Hook by stepwise flow rate high-speed countercurrent chromatography. J Liq Chromatogr & Rel Technol 29:1609-1618

- Wei Y, Ito Y (2007) Isolation of hyperoside and luteolin-glucoside from *Agrimonia pilosa* Ledeb using stepwise elution by high-speed countercurrent chromatography. *J Liq Chromatogr & Rel Technol* 30:1465-1473
- Wei Y, Zhang K, Yin L et al (2012b) Isolation of bioactive components from *Flaveria bidentis* (L.) Kuntze using high-speed counter-current chromatography and time-controlled collection method. *J Sep Sci* 35:869-874
- Weisz A, Mazzola EP, Murphy CM et al (2002) Preparative separation of isomeric sulfophthalic acids by conventional and pH zone refining counter current chromatography. *J Chromatogr A* 966:111-118
- Wu D, Jiang X, Wu S (2010) Direct purification of tanshinones from *Salvia miltiorrhiza* Bunge by high-speed counter-current chromatography without presaturation of the two-phase solvent mixture. *J Sep Sci* 33:67-73
- Wu H, Feng R, Guan S et al (2012a) Rapid preparative isolation of a new phenylpropanoid glycoside and four minor compounds from *Sparganium stoloniferum* using high-speed counter-current chromatography as a fractionation tool. *J Sep Sci* 35:1160-1166
- Wu H, Su Z, Yang Y et al (2007) Isolation of three sesquiterpene lactones from the roots of *Cichorium glandulosum* Boiss. et Huet. by high-speed counter-current chromatography. *J Chromatogr A* 1176:217-222
- Wu J, Chen Z, Zhang C et al (2013c) Effective and preparative separation of bioactive flavonoids from *Gynostemma pentaphyllum* using elution-extrusion counter-current chromatography. *Sep Sci Technol* 48:909-914
- Wu J, Chen Z, Zhao Y et al (2013b) One-step purification of astilbin from *Smilax glabra* by high-performance centrifugal partition chromatography. *J Liq Chromatogr & Rel Technol* 36:1540-1548
- Wu S, Sun C, Cao X et al. (2004c) Preparative counter current chromatography isolation of liensinine and its analogues from embryo of the seed of *Nelumbo nucifera* Gaertn. using upright coil planet centrifuge with four multilayer coils connected in series. *J Chromatogr A* 1041:153-162
- Wu S, Sun C, Pei S et al (2004b) Preparative isolation and purification of amides from the fruits of *Piper longum* by upright counter current chromatography and reversed phase liquid chromatography. *J Chromatogr A* 1040:193-204
- Wu S, Sun C, Wang K et al (2004a) Preparative isolation and purification of celastrol from *Celastrus orbicularis* Thunb. by a new counter current chromatography method with an upright coil planet centrifuge. *J Chromatogr A* 1028:171-174
- Wu S, Yang L, Gao Y et al (2008) Multi-channel counter-current chromatography for high-throughput fractionation of natural products for drug discovery. *J Chromatogr A* 1180:99-107
- Wu S, Sun A, Liu R (2005) Separation and purification of baicalin and wogonoside from the Chinese medicinal plant *Scutellaria baicalensis* Georgi by high-speed counter-current chromatography. *J Chromatogr A* 1066:243-247
- Wu T, Lin J, Yang Y et al (2009) Preparative isolation of three flavonoids from *Flos Gossypii* by high-speed counter-current chromatography. *Sep Purif Technol* 66:295-298
- Wu W, Ye H, Tang M et al (2012b) Using high-performance counter-current chromatography combined with preparative high performance liquid chromatography for the separation of bioactive compounds from the water extract of *Gentiana macrophylla* Pall. *Sep Sci Technol* 47:762-768
- Wu X, Zhong J, Xie Z et al (2013a) Isolation and purification of aloin, isoaloeresin d and aloenin-2'-p-coumaroyl ester from *Aloe barbadensis* Mill by high-speed counter-current chromatography. *J Liq Chromatogr & Rel Technol* 36:2589-2600
- Xia G, Hong S, Liu S (2014) Simultaneous preparation of naturally abundant and rare catechins by tannase-mediated biotransformation combining high speed counter current chromatography. *Food Chem* 151:380-384
- Xiao G, Li G, Chen L et al (2010) Isolation of antioxidants from *Psoralea corylifolia* fruits using high-speed counter-current chromatography guided by thin layer chromatography-antioxidant autographic assay. *J Chromatogr A* 1217:5470-5476
- Xiao W, Han L, Shi B (2009b) Isolation and purification of flavonoid glucosides from *Radix Astragali* by high-speed counter-current chromatography. *J Chromatogr B* 877:697-702
- Xiao X, Guo Z, Deng J et al (2009a) Separation and purification of isofraxidin from *Sarcandra glabra* by microwave-assisted extraction coupled with high-speed counter-current chromatography. *Sep Purif Technol* 68:250-254
- Xiao X, Si X, Tong X et al (2011) Preparation of flavonoids and diarylheptanoid from *Alpinia katsumadai* Hayata by microwave-assisted extraction and high-speed counter-current chromatography. *Sep Purif Technol* 81:265-269
- Xiao X, Si X, Tong X et al (2012a) Ultrasonic microwave-assisted extraction coupled with high-speed counter-current chromatography for the preparation of nigakinones from *Picrasma quassioides* (D. Don) Benn. *Phytochem Anal* 23:540-546
- Xiao X, Si X, Yuan Z et al (2012b) Isolation of fucoxanthin from edible brown algae by microwave-assisted extraction coupled with high-speed countercurrent chromatography. *J Sep Sci* 35:2313-2317
- Xiao XH, Yuan ZQ, Li GK (2013) Preparation of phytosterols and phytol from edible marine algae by microwave-assisted extraction and high-speed counter-current chromatography. *Sep Purif Technol* 104:284-289
- Xiao XH, Yuan ZQ, Li GK (2014) Separation and purification of steroidal saponins from *Paris polyphylla* by microwave-assisted extraction coupled with countercurrent chromatography using evaporative light scattering detection. *J Sep Sci* 37:635-641
- Xie C, Xu X, Liu Q et al (2012c) Isolation and purification of echinacoside and acteoside from *Cistanche tubulosa* (Schrenk) Wight by high-speed counter-current chromatography. *J Liq Chromatogr & Rel Technol* 35:2602-2609
- Xie H, Liang Y, Ito Y et al (2011) Preparative isolation and purification of four flavonoids from *Daphne genkwa* Sieb. et Zucc. by high-speed countercurrent chromatography. *J Liq Chromatogr & Rel Technol* 34: 2360-2372
- Xie J, Deng J, Tan F et al (2010a) Separation and purification of echinacoside from *Penstemon barbatus* (Can.) Roth by recycling high-speed counter-current chromatography. *J Chromatogr B* 878:2665-2668

- Xie J, Sun B, Wang S et al (2009) Isolation and purification of nootkatone from the essential oil of fruits of *Alpinia oxyphylla* Miqel by high-speed counter-current chromatography. *Food Chem* 117:375-380
- Xie J, Wang S, Sun B et al (2008) Preparative separation and purification of β -caryophyllene from leaf oil of *Vitex negundo* L. var. *heterophylla* (Franch.) Rehd. by high speed countercurrent chromatography. *J Liq Chromatogr & Rel Technol* 31:2621-2631
- Xie J, Tan F, Zhu J et al (2012a) Separation, purification and quantification of verbascoside from *Penstemon barbatus* (Cav.) Roth. *Food Chem* 135:2536-2541
- Xie Q, Wei Y, Zhang G (2010b) Separation of flavonol glycosides from *Flaveria bidentis* (L.) Kuntze by high-speed counter-current chromatography. *Sep Purif Technol* 72:229-233
- Xie Q, Yin L, Zhang G et al (2012b) Separation and purification of isorhamnetin 3-sulphate from *Flaveria bidentis* (L.) Kuntze by counter-current chromatography comparing two kinds of solvent systems. *J Sep Sci* 35:159-165
- Xie Y, Liang Y, Chen HW et al (2007) Preparative isolation and purification of anthraquinones from *Cassia* seed by high-speed countercurrent chromatography. *J Liq Chromatogr & Rel Technol* 30:1475-1488
- Xie Z, Huang J, Xie Z et al. (2014a) Isolation and purification of isoquercitrin and quercitrin from *Hypericum japonicum* Thunb. ex Murray by counter-current chromatography. *Sep Sci Technol* 49:778-782
- Xie Z, Sun Y, Lam S et al. (2014b) Extraction and isolation of flavonoid glycosides from *Flos Sophorae immaturus* using ultrasonic-assisted extraction followed by high-speed countercurrent chromatography. *J Sep Sci* 37:957-965
- Xin X, Yang Y, Zhong J et al (2009) Preparative isolation and purification of isobenzofuranone derivatives and saponins from seeds of *Nigella glandulifera* Freyn by high-speed counter-current chromatography combined with gel filtration. *J Chromatogr A* 1216:4258-4262
- Xin XL, Liu J, Ma XC et al (2010) Preparative separation of four major bufadienolides from the Chinese traditional medicine, *Chansu*, using high-speed counter-current chromatography. *Nat Prod Commun* 5:1031-1034
- Xu H, Zhou T, Wen J et al. (2009) Isolation and purification of three flavonoids from the hawthorn leaves by high speed countercurrent chromatography, combined with isocratic preparative reversed-phase high performance liquid chromatography. *J Liq Chromatogr & Rel Technol* 32: 2216-2231
- Xu J, Luo J, Kong L (2013) Simultaneous separation of triterpenoid saponins and flavonoid glycosides from the roots of *Glycyrrhiza uralensis* Fisch by pH-zone-refining counter-current chromatography. *J Sep Sci* 36:3295-3301
- Xü K, Deng R, Lü HT (2011) Preparative isolation and purification of phlorizin from apple tree bark by high-speed counter-current chromatography. *Asian J Chem* 23:3807-3810
- Xü K, Lü H, Qü B et al (2010) High-speed counter-current chromatography preparative separation and purification of phloretin from apple tree bark. *Sep Purif Technol* 72:406-409
- Xu L, Li A, Sun A et al. (2010) Preparative isolation of neomangiferin and mangiferin from *Rhizoma anemarrhenae* by high-speed countercurrent chromatography using ionic liquids as a two-phase solvent system modifier. *J Sep Sci* 33:31-36
- Xu P, Guan S, Feng R et al (2012) Separation of four homoisoflavonoids from *Caesalpinia sappan* by high-speed counter-current chromatography. *Phytochem Anal* 23:228-231
- Xu S, Sun Y, Jing F et al (2011a) Separation and purification of flavones from *Nelumbo nucifera* Gaertn. by silica gel chromatography and high-speed counter-current chromatography. *Chin J Chromatogr* 29:1244-1248
- Xu X, Sun CR, Dai XJ et al (2011b) LC/MS guided isolation of alkaloids from lotus leaves by pH-zone-refining counter-current chromatography. *Molecules* 16:2551-2560
- Xu Y, Han X, Dong D et al (2008) Efficient protocol for purification of diosgenin and two fatty acids from *Rhizoma dioscoreae* by SFE coupled with high-speed counter-current chromatography and evaporative light scattering detection. *J Sep Sci* 31:3638-3646
- Yamashita-Higuchi Y, Sugimoto S, Matsunami K et al. (2014) Grevillosides J–Q, arbutin derivatives from the leaves of *Grevillea robusta* and their melanogenesis inhibitory activity. *Chem Pharm Bull* 62:364–372
- Yan G, Ji L, Luo Y et al (2012) Preparative isolation and purification of three sesquiterpenoid lactones from *Eupatorium lindleyanum* DC. by high-speed counter-current chromatography. *Molecules* 17:9002-9009
- Yan J, Tong S, Chu J et al. (2004) Preparative isolation and purification of syringin and edgeworoside C from *Edgeworthia chrysantha* Lindl by high speed countercurrent chromatography. *J Chromatogr A* 1043:329-332
- Yan J, Tong S, Li J et al (2006) Preparative isolation and purification of amygdalin from *Prunus armeniaca* L. with high recovery by high-speed countercurrent chromatography. *J Liq Chromatogr & Rel Technol* 29:1271-1279
- Yan J, Chen G, Tong S et al (2005) Preparative isolation and purification of germacrone and curdione from the essential oil of the rhizomes of *Curcuma wenyujin* by high-speed counter-current chromatography. *J Chromatogr A* 1070:207-210
- Yanagida A, Shoji A, Shibusawa Y et al (2006) Analytical separation of tea catechins and food-related polyphenols by high-speed counter-current chromatography. *J Chromatogr A* 1112:195-201
- Yang C, Tang Q, Liu J et al (2008a) Preparative isolation and purification of phenolic acids from *Smilax china* by high-speed counter-current chromatography. *Sep Purif Technol* 61:474-478
- Yang C, Yang Y, Aisa HA et al (2012a) Bioassay-guided isolation of antioxidants from *Astragalus altaicus* by combination of chromatographic techniques. *J Sep Sci* 35:977-983
- Yang Ch, Li D, Wan X (2008c) Combination of HSCCC and Sephadex LH-20 methods. An approach to isolation and purification of the main individual theaflavins from black tea. *J Chromatogr B* 861:140-144

- Yang F, Zhang T, Liu O et al (2000) Preparative isolation and purification of notopterol and isoimperatorin from *Notopterygium forbesii* Boiss (Chinese Traditional medicinal herb) by high-speed counter-current chromatography. *J Chromatogr A* 883:67-73
- Yang F, Ito Y (2002) Preparative separation of lappaconitine, ranaconitine, N-deacetylappaconitine and N-deacetylranaconitine from crude alkaloids of sample *Aconitum sinomontanum* Nakai by high speed counter current chromatography. *J Chromatogr A* 943:219-225
- Yang F, Ma Y, Ito Y (2001b) Separation and purification of isoflavones from a crude soybean extract by high-speed counter-current chromatography. *J Chromatogr A* 928:163-170
- Yang F, Ou Q, Yu W (1995) Semi-preparative separation of taraxeryl-acetate and coumarins from *Artemisia dalailamae* Kraschen by high-speed countercurrent chromatography. *J Liq Chromatogr* 18:395-403
- Yang F, Quan J, Zhang TY et al (1998a) Multidimensional counter-current chromatographic system and its application. *J Chromatogr A* 803:298-301
- Yang F, Zhang T, Ito Y (2001a) Large-scale separation of resveratrol, anthraglycoside A and anthraglycoside B from *Polygonum cuspidatum* Sieb. et Zucc by high-speed counter-current chromatography. *J Chromatogr A* 919:443-448
- Yang F, Zhang T, Zhang R et al (1998c) Application of analytical and preparative high-speed counter-current chromatography for separation of alkaloids from *Coptis chinensis* Franch. *J Chromatogr* 829:137-141
- Yang FQ, Zhang TY, Mo BX et al (1998b) Preparative separation and purification of kaempferol, isorhamnetin, and quercetin by high-speed countercurrent chromatography. *J Liq Chromatogr & Rel Technol* 21:209-216
- Yang J, Ye H, Lai H (2012b) Separation of anthraquinone compounds from the seed of *Cassia obtusifolia* L. using recycling counter-current chromatography. *J Sep Sci* 35:256-262
- Yang M, Xu X, Xie C et al (2013b) Separation and purification of arctiin, arctigenin, matairesinol, and lappaol F from *Fructus Arctii* by high-speed counter-current chromatography. *Sep Sci Technol* 48:1738-1744
- Yang M, Xu X, Xie C et al (2013a) Isolation and purification of forsythoside a and suspensaside a from *Forsythia suspensa* by high-speed counter-current chromatography. *J Liq Chromatogr & Rel Technol* 36:2895-2904
- Yang Y, Bakri M, Gu D et al (2013c) Separation of (S)-dehydrovomifoliol from leaves of *Nitraria sibirica* Pall. by high-speed counter-current chromatography. *J Liq Chromatogr & Rel Technol* 36:573-582
- Yang Y, Gu D, Chen Q (2013e) A sample pretreatment strategy for pH-zone-refining counter-current chromatography. *J Chromatogr A* 1273:44-48
- Yang Y, Gu D, Wu H et al (2008b) Application of preparative high-speed countercurrent chromatography for separation of elatine from *Delphinium shawurense*. *J Liq Chromatogr & Rel Technol* 31:3012-3019
- Yang Y, Gu D, Yili A et al (2010) One-step separation and purification of rupestonic acid and chrysosptertin B from *Artemisia rupestris* L. by high-speed counter-current chromatography. *Phytochem Anal* 21:205-209
- Yang Y, Huang Y, Gu D et al (2009) Separation and purification of three flavonoids from *Helichrysum arenarium* (L.) Moench by HSCCC. *Chromatographia* 69:963-967
- Yang YM, Lloyd HA, Pannell LK et al (1986) Separation of the components of commercial digitonin using high-performance liquid chromatography and centrifugal countercurrent chromatography. Identification of the products by californium-252 plasma desorption mass spectrometry. *Biomed Environ Mass Spectr* 13:439-445
- Yang Z, Liu X, Wang K et al (2013d) Novel linear and step-gradient counter-current chromatography for bio-guided isolation and purification of cytotoxic podophyllotoxins from *Dyosma versipellis* (Hance). *J Sep Sci* 36:1022-1028
- Yao S, Luo J, Huang X et al (2008) Application of preparative high-speed counter-current chromatography/preparative high-performance liquid chromatography mode in rapid separation of saponins. *J Chromatogr B* 864:69-77
- Yao S, Li Y, Kong L (2006) Preparative isolation and purification of chemical constituents from the root of *Polygonum multiflorum* by high-speed counter-current chromatography. *J Chromatogr A* 1115:64-71
- Ye H, Chen L, Li Y et al (2008a) Preparative isolation and purification of three rotenoids and one isoflavone from the seeds of *Millettia pachycarpa* Benth by high-speed counter-current chromatography. *J Chromatogr A* 1178:101-107
- Ye H, Ignatova S, Luo H et al (2008b) Preparative separation of a terpenoid and alkaloids from *Tripterygium wilfordii* Hook. using high-performance counter-current chromatography. Comparison of various elution and operating strategies. *J Chromatogr A* 1213:145-153
- Ye H, Zhong S, Li Y et al (2010) Enrichment and isolation of barbigerone from *Millettia pachycarpa* Benth. using high-speed counter-current chromatography and preparative HPLC. *J Sep Sci* 33:1010-1017
- Ye Q, Tan X, Zhu L et al (2012) Isolation and purification of diarylheptanoids from *Alpinia officinarum* Hance by high-speed counter-current chromatography. *Chin J Chromatogr* 30:332-336
- Yeh JC, Garrard IJ, Cho CWC et al (2012) Bioactivity-guided fractionation of the volatile oil of *Angelica sinensis* radix designed to preserve the synergistic effects of the mixture followed by identification of the active principles. *J Chromatogr A* 1236:132-138
- Yin H, Zhang S, Luo X et al (2008) Preparative isolation and purification of two benzoxazinoid glucosides from *Acanthus ilicifolius* L. by high-speed counter-current chromatography. *J Chromatogr A* 1205:177-181
- Yin LH, Xu LN, Han X et al (2007) Preparative isolation and purification of rutin from *Boenninghausenia sessilicarpa* Le'vl by high speed counter-current chromatography. *J Dalian Med Univ* 29:532-534
- Ying H, Jiang H, Liu H et al. (2014a) Ethyl acetate-n-butanol gradient solvent system for high-speed countercurrent chromatography to screen bioactive substances in okra. *J Chromatogr A* 1359:117-123

- Ying H, Liu J, Du Q (2014b) Analysis and determination of oestrogen-active compounds in *Fructus Amomi* by the combination of high-speed counter-current chromatography and high performance liquid chromatography. *J Chromatogr B* 958:36-42
- Yoon KD, Chin YW, Ahn MJ et al (2009) Preparative isolation of alisol B and alisol B 23-acetate from *Alismatis rhizoma* by centrifugal partition chromatography coupled with ELSD. *Chromatographia* 69:791-793
- Yoon KD, Chin YW, Yang MH et al (2011) Separation of anti-ulcer flavonoids from *Artemisia* extracts by high-speed counter-current chromatography. *Food Chem* 129:679-683
- Yoon KD, Kim J (2008) Preparative separation of dioscin derivatives from *Dioscorea villosa* by centrifugal partition chromatography coupled with evaporative light scattering detection. *J Sep Sci* 31:2486-2491
- Yoon KD, Kim J (2009) Application of centrifugal partition chromatography coupled with evaporative light scattering detection for the isolation of saikosaponins-a and -c from *Bupleurum falcatum* roots. *J Sep Sci* 32:74-78
- Yoon KD, Chin YW, Yang MH et al (2012) Application of high-speed counter-current chromatography-evaporative light scattering detection for the separation of seven steroidal saponins from *Dioscorea villosa*. *Phytochem Anal* 23:462-468
- Young Kim C, Ahn MJ, Kim J (2006) Preparative isolation of mangiferin from *Anemarrhena asphodeloides* rhizomes by centrifugal partition chromatography. *J Liq Chromatogr & Rel Technol* 29:869-875
- Yu Q, Tong S, Yan J et al (2011a) Preparative separation of quaternary ammonium alkaloids from *Corydalis yanhusuo* W. T. Wang by pH-zone-refining counter-current chromatography. *J Sep Sci* 34: 278-285
- Yu XL, Pi ZF, Hu XL et al. (2014b) High performance preparation and structural confirmation of lignans from *Schisandrae chinensis* fructus by using HSCCC combined with ESI-MSⁿ method. *Yaoxue Xuebao* 49:78-82
- Yu XX, Huang JY, Xu D et al. (2014a) Isolation and purification of orientin and vitexin from *Trollius chinensis* Bunge by high-speed counter-current chromatography. *Nat Prod Res* 28:674-676
- Yu Y, Zhang QW, Li SP (2011b) Preparative purification of coniferyl ferulate from *Angelica sinensis* oil by high performance centrifugal partition chromatography. *J Med Plants Res* 5:104-108
- Yuan E, Liu B, Ning Z et al (2009) Preparative separation of flavonoids in *Adinandra nitida* leaves by high-speed counter-current chromatography and their effects on human epidermal carcinoma cancer cells. *Food Chem* 115:1158-1163
- Yuan L, Fu R, Zhang T et al (1998) Separation of alkaloids in tea by high-speed counter-current chromatography. *Chin J Chromatogr* 16:361-362
- Yuan LM, Chen XX, Ai P et al (2001) Versatile two-phase solvent system for anthraquinone prefractionation by high-speed counter-current chromatography. *J Liq Chromatogr* 24:2961-2970
- Yuan LM, Wu P, Xia T et al (2002) Preparative separation of alkaloids from *Cortex Phellodendri* by high speed counter-current chromatography. *Chin J Chromatogr* 2092:185-186
- Yuan Y, Hou W, Tang M et al (2008a) Separation of flavonoids from the leaves of *Oroxylum indicum* by HSCCC. *Chromatographia* 68:885-892
- Yuan Y, Wang B, Chen L, Luo H, Fisher D, Sutherland IA (2008b) How to realize the linear scale-up process for rapid purification using high-performance counter-current chromatography. *J Chromatogr A* 1194: 192-198
- Yue HL, Zhao XH, Mei LJ et al (2013b) Separation and purification of five phenylpropanoid glycosides from *Lamiophlomis rotata* (Benth.) Kudo by a macroporous resin column combined with high-speed counter-current chromatography. *J Sep Sci* 36:3123-3129
- Yue HL, Zhao XH, Wang QL et al (2013a) Separation and purification of water-soluble iridoid glucosides by high speed counter-current chromatography combined with macroporous resin column separation. *J Chromatogr B* 936:57-62
- Zanatta CF, Cuevas E, Bobbio FO et al (2005) Determination of anthocyanins from Camu-camu (*Myrciaria dubia*) by HPLC-PDA, HPLC-MS, and NMR. *J Agric Food Chem* 53:9531-9535
- Zga N, Papastamoulis Y, Toribio A et al. (2009) Preparative purification of anti-amyloidogenic stilbenoids from *Vitis vinifera* (Chardonnay) stems by centrifugal partition chromatography. *J Chromatogr B* 877:1000-1004
- Zhan K, Xu K, Yin H (2011) Preparative separation and purification of gingerols from ginger (*Zingiber officinale* Roscoe) by high-speed counter-current chromatography. *Food Chem* 126:1959-1963
- Zhang F D, Teng H, Li G et al (2006) Separation and purification of Z-ligustilide and senkyunolide a from *Ligusticum chuanxiong* Hort. with supercritical fluid extraction and high-speed counter-current chromatography. *Sep Sci Technol* 41:3397-3408
- Zhang H, Feng B, Liu K et al (2013b) Isolation and purification of two triterpenoids from the chinese medicinal plant *Fomes officinalis* Ames. *Asian J Chem* 25:6130-6132
- Zhang H, Li B, Zong X et al (2013c) Preparative separation of flavonoids in plant extract of *Smilacis glabrae* Roxb. by high performance counter-current chromatography. *J Sep Sci* 36:1853-1860
- Zhang J, Zhu X, Luo F et al (2012c) Separation and purification of neohesperidin from the albedo of *Citrus reticulata* cv. *suavissima* by combination of macroporous resin and high-speed counter-current chromatography. *J Sep Sci* 35:128-136
- Zhang J, Huang X, Sun X et al. (2014) Efficient method for the screening and identification of anti-diabetic components in the leaves of *Olea europaea* L. *New J Chem* 38:3796-3802
- Zhang J, Sun C, Yan Y et al (2012a) Purification of naringin and neohesperidin from Huyou (*Citrus changshanensis*) fruit and their effects on glucose consumption in human HepG2 cells. *Food Chem* 135:1471-1478
- Zhang M, Ignatova S, Liang Q et al (2009) Rapid and high-throughput purification of salvianolic acid B from *Salvia miltiorrhiza* Bunge by high-performance counter-current chromatography. *J Chromatogr A* 1216:3869-3873

- Zhang M, Ignatova S, Hu P et al (2012b) Cost-efficient and process-efficient separation of geniposide from *Gardenia jasminoides* Ellis by high-performance counter-current chromatography. *Sep Purif Technol* 89:193-198
- Zhang Q, Chen LJ, Ye HY et al (2007) Isolation and purification of ginkgo flavonol glycosides from *Ginkgo biloba* leaves by high-speed counter-current chromatography. *J Sep Sci* 30:2153-2159
- Zhang S, Ou Q (1995) Preparative separation of chemical ingredients from *Podophyllum emodii* var. *chinensis* Sprague by high-speed countercurrent chromatography. *Microchem J* 52:155-158
- Zhang S, Wang M, Wang C (2011b) Preparative separation and purification of alkaloids from *Rhizoma coptidis* by high-speed counter-current chromatography. *Sep Purif Technol* 76:428-431
- Zhang S, Wang X, Ouyang F et al. (2008) Separation and purification of dl-tetrahydropalmatine from *Corydalis yanhusuo* W. T. Wang by HSCCC with a new solvent system screening method. *J Liq Chromatogr & Rel Technol* 31:2632-2642
- Zhang T, Cao X, Han X (2003) Preparation of national certified reference materials of active compounds from natural products by CCC. *J Liq Chromatogr & Rel Technol* 26:1565-1577
- Zhang TY, Cai DG, Ito Y (1988b) Separations of flavonoids and alkaloids in medicinal herbs by high-speed counter-current chromatography. *J Chromatogr* 435:159-166
- Zhang TY, Hua X, Xia R et al (1988a) Separation of flavonoids in crude extract from sea buckthorn by countercurrent chromatography with two types of coil planet centrifuge. *J Liq Chromatogr* 11:233-244
- Zhang TY, Xiao R, Xiao ZY et al (1988c) Rapid separation of flavonoids by analytical high-speed counter-current chromatography. *J Chromatogr A* 445:199-206
- Zhang X, Ito Y, Liang J et al (2013a) Preparative isolation and purification of five steroid saponins from *Dioscorea zingiberensis* C.H. Wright by counter-current chromatography coupled with evaporative light scattering detector. *J Pharm Biomed Anal* 84:117-123
- Zhang Y, Shi S, Wang Y et al (2011a) Target-guided isolation and purification of antioxidants from *Selaginella sinensis* by offline coupling of DPPH-HPLC and HSCCC experiments. *J Chromatogr B* 879:191-196
- Zhao C, He C (2006) Preparative isolation and purification of atractylon and atractylenolide III from the Chinese medicinal plant *Atractylodes macrocephala* by high-speed counter-current chromatography. *J Sep Sci* 29:1630-1636
- Zhao D, Yan M, Huang Y et al (2012a) Efficient protocol for isolation and purification of different soyasaponins from soy hypocotyls. *J Sep Sci* 35:3281-3292
- Zhao M, Ito Y, Tu P (2005) Isolation of a novel flavanone 6-glucoside from the flowers of *Carthamus tinctorium* (Honghua) by high-speed counter-current chromatography. *J Chromatogr A* 1090:193-196
- Zhao W, He J, Zhang Y et al (2012b) Preparative isolation and purification of alkaloids from *Picrasma quassiodes* (D. Don) Benn. by high-speed countercurrent chromatography. *J Liq Chromatogr & Rel Technol* 35:1597-1606
- Zhao WH, Gao CC, Ma XF et al (2007) The isolation of 1,2,3,4,6-penta-O-galloyl- β -D-glucose from *Acer truncatum* Bunge by high-speed counter-current chromatography. *J Chromatogr B* 850:523-527
- Zhao XH, Han F, Li YL et al (2013a) Semi-preparative separation and purification of three flavonoids from *Pedicularis longiflora* var. *tubiformis* (Klotzsch) P. C. Tsoong by HSCCC. *J Liq Chromatogr & Rel Technol* 36:1751-1761
- Zhao XH, Han F, Li YL et al (2013b) Preparative isolation and purification of three stilbene glycosides from the Tibetan medicinal plant *Rheum tanguticum* maxim. Ex Balf. by high-speed counter-current chromatography. *Phytochem Anal* 24:171-175
- Zheng Z, Wang M, Wang D et al (2010) Preparative separation of alkaloids from *Nelumbo nucifera* leaves by conventional and pH-zone-refining counter-current chromatography. *J Chromatogr B* 878:1647-1651
- Zheng ZJ, Yang B, Xu MX et al (2011) Separation and preparation of alkaloids in *Nelumbinis Folium* by pH-zone-refining counter-current chromatography. *Chin Trad Herb Drugs* 42:684-686
- Zhong JS, Wan JZ, Ding WJ et al. (2014) One-step separation and purification of two chromones and one pyrone from *Aloe barbadensis* Miller: A comparison between reversed-phase flash chromatography and high-speed counter current chromatography. *Phytochem Anal* 25:282-288
- Zhou H, Lv J, Yuan Q (2010) Preparative isolation and purification of punicalin from pomegranate husk by high-speed countercurrent chromatography. *Sep Purif Technol* 72:225-228
- Zhou JY, Fang QC, Lee YW (1990) The application of high-speed countercurrent chromatography to the semipreparative separation of vincamine and vincine. *Phytochem Anal* 1:74-76
- Zhou T, Chen B, Fan G et al (2006) Application of high-speed counter-current chromatography coupled with high-performance liquid chromatography-diode array detection for the preparative isolation and purification of hyperoside from *Hypericum perforatum* with online purity monitoring. *J Chromatogr A* 1116:97-101
- Zhou T, Fan G, Hong Z et al (2005a) Large-scale isolation and purification of geniposide from the fruit of *Gardenia jasminoides* Ellis by high-speed counter-current chromatography. *J Chromatogr A* 1100:76-80
- Zhou T, Zhu Z, Wang C et al (2007) On-line purity monitoring in high-speed counter-current chromatography: Application of HSCCC-HPLC-DAD for the preparation of 5-HMF, neomangiferin and mangiferin from *Anemarrhena asphodeloides* Bunge. *J Pharm Biomed Anal* 44:96-100
- Zhou X, Peng J, Fan G et al (2005b) Isolation and purification of flavonoid glycosides from *Trollius ledebouri* using high-speed counter-current chromatography by stepwise increasing the flow-rate of the mobile phase. *J Chromatogr A* 1092:216-221
- Zhou YJ, Chen F, Li Z (2002) Preparative separation of β -sitosterol by high speed countercurrent chromatography. *J Liq Chromatogr & Rel Technol* 25:1693-1701

- Zhu L, Li H, Liang Y et al (2009) Application of high-speed counter-current chromatography and preparative high-performance liquid chromatography mode for rapid isolation of anthraquinones from *Morinda officinalis* How. Sep Purif Technol 70:147-152
- Zhu L, Yu S, Zeng X et al (2008) Preparative separation and purification of five anthraquinones from *Cassia tora* L. by high-speed counter-current chromatography. Sep Purif Technol 63:665-669
- Zhu L, Zhao Z, Yu S et al (2010) Isolation and purification of flavonoid glycosides from sugarcane (*Saccharum officinarum* L.) juice by high-speed counter-current chromatography. Int Sugar J 112:24-29
- Zhu Q, Liu F, Xu M et al (2012) Ultrahigh pressure extraction of lignan compounds from *Dysosma versipellis* and purification by high-speed counter-current chromatography. J Chromatogr B 905:145-149
- Zhu X, Luo F, Zheng Y et al (2013) Characterization, purification of poncirin from edible citrus ougan (*Citrus reticulata* cv. *suavissima*) and its growth inhibitory effect on human gastric cancer cells SGC-7901. Int J Molec Sci 14:8684-8697