Supplementary information for:

New ionic liquids based on systemic acquired resistance inducers combined with phytotoxicity reducing cholinium cation

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SYNTHESIS:

Materials.

All of reactions were conducted on commercially available pure solvents (abcr GmbH & Co. KG (Germany), POCh S.A. (Poland), CHEMPUR (Poland)). Cholinium chloride, cholinium hydroxide, sodium salicylate, sodium saccharinate, acids: azelaic, pipecolic, lactic, nicotinic, isonicotinic, oxalic, succinic, 2,6-dichloroisonicotinic, α-aminobutyric, β-aminobutyric, γ-aminobutyric and 3-aminopropionic (β-alanine) were purchased from SIGMA-ALDRICH Corporation (USA). All of chiral aminoacids were used as a racemate. Cholinium benzo[1,2,3]thiadiazole-7-carboxylate, [Chol][BTHCOO] were synthesized as it was described by us previously.[1]

NMR

^{1}H NMR spectra were recorded on a Bruker BioSpin (400 MHz) spectrometer using *d6*-DMSO as solvent with tetreamethylsilane as the internal standard. Proton chemical shifts are shown in parts per million (δ ppm).

General method of synthesis cholinium-based ionic liquids are described below:

Synthesis of cholinium salicylate [Chol][Sal] and saccharinate [Chol][Sacc]

10 mmol sodium salicylate dissolved in 20 mL of methanol was added to 10 mmol of choline chloride also dissolved in 20 mL of methanol and stirred by 10 minutes. Subsequently, solvent was evaporated and dried under high vacuum (24h, 40^{o}C) to remove water and methanol residues. Then 1 ml of dried methanol was added to separate from organic solution inorganic side product – NaCl. Organic phase was filtered and evaporated. Yellow viscous oil was obtained with yield >95%.

Synthesis of cholinium azelate [Chol][Aze], cholinium pipecolate [Chol][Pip], cholinium lactate [Chol][Lac], cholinium nicotinate [Chol][Nic], cholinium isonicotinate [Chol][Iso], cholinium oxalate [Chol][Oxa], cholinium succinate [Chol][Suc], cholinium 2,6-dichloroisonicotinate [Chol][Ina], cholinium α-aminobutyrate [Chol][AABA], cholinium β-aminobutyrate [Chol][BABA], cholinium γ-aminobutyrate [Chol][GABA] and cholinium 3-aminopropanoate [Chol][ALA]

10 mmol of Cholinium hydroxide (as 40% solution in methanol) were to 10mmol of acid or aminoacid dissolved in 20 ml of methanol. The mixture was stirred by 30 minutes in 50^{o}C. After the reaction, solution was evaporated and dried under high vacuum (48h, 40^{o}C). Yellow viscous liquids were obtained with yield <99%.

NMR data of obtained compounds:

Cholinium oxalate [Chol][Oxa]

^{1}H NMR (400 MHz, [D_6]DMSO, 25^{o}C, TMS)) δ/ppm = 3.85 (4 H, m, **CH_2**-OH), 3.43 (4 H, dd, *J* = 5.6, 4.4 Hz, N-**CH_2**-), 3.14 (18 H, s, N-**CH_3**),

^{13}C NMR (101 MHz, DMSO) δ/ppm = 164.89, 67.44, 55.56, 53.88, 40.54, 40.43, 40.29, 39.98, 39.77, 39.56, 39.35;

IR (ATR, ν_{max}, cm^{-1}): 3207 (m, br), 3028 (m,s), 1557 (m,s), 1476 (m,s), 1294 (m,s), 1085 (w,s), 953 (w,s);

HRMS *m/z*: Calcd for $C_5H_{14}ON^+$ 104.1075; Found 104.1073, Δ -1.9211

HRMS *m/z*: Calcd for $C_2O_4^{2-}$ 192.0872; Found 192.0873, Δ 0.3384

Cholinium succinate [Chol][Suc]

^{1}H NMR (400 MHz, [D$_6$]DMSO, 25°C, TMS)) δ/ppm = 4.81 (4 H, s, (-**CH$_2$**-COO$^-$)$_2$), 4.08 (2 H, ddd, *J* = 6.8, 5.3, 2.8 Hz, **CH$_2$**-OH), 3.53 (2 H, m, N-**CH$_2$**-), 3.22 (9 H, s, N-**CH$_3$**);

^{13}C NMR (101 MHz, DMSO) δ/ppm = δ 170.24, 67.46, 55.57, 53.61, 40.62, 40.41, 40.20, 39.99, 39.79, 39.58, 39.37, 29.18;

IR (ATR, ν_{max}, cm^{-1}): 3163 (m, br), 2974 (m,s), 1561 (m,s), 1479 (m,s), 1371 (m,s), 1087 (w,s), 954 (w,s);

HRMS *m/z*: Calcd for $C_5H_{14}ON^+$ 104.1075; Found 104.1074, Δ -0.9605

HRMS *m/z*: Calcd for $C_4H_4O_4^{2-}$ 220.1184; Found 220.1186, Δ 0.7269

Cholinium azelate [Chol][Aze]

^{1}H NMR (400 MHz, [D$_6$]DMSO, 25°C, TMS)) δ/ppm = 3.85 (4 H, m, **CH$_2$**-OH), 3.44 (4 H, dd, *J* = 5.7, 4.2 Hz, N-**CH$_2$**-), 3.15 (18 H, s, N-**CH$_3$**), 1.83 (4 H, t, *J* = 4.2 Hz, -**CH2**-COO$^-$), 1.39 (4 H, m, **CH$_2$**-CH$_2$-COO$^-$), 1.19 (6 H, d, *J* = 4.0 Hz,-**CH$_2$-CH$_2$-CH$_2$-**);

^{13}C NMR (101 MHz, DMSO) δ/ppm = 176.79, 67.73, 55.39, 53.57, 53.50, 40.57, 40.36, 40.15, 39.94, 39.73, 39.52, 39.31, 29.96, 29.69, 27.03;

IR (ATR, ν_{max}, cm^{-1}): 3236 (m, br), 2927 (m,s), 1557 (m,s), 1482 (m,s), 1392 (m,s), 1087 (w,s), 953 (w,s);

HRMS *m/z*: Calcd for $C_5H_{14}ON^+$ 104.1075; Found 104.1077, Δ 1.9211

HRMS *m/z*: Calcd for $C_9H_{14}O_4^{2-}$ 290.1967; Found 290.1963, Δ -1.3784

Cholinium lactate [Chol][Lac]

^{1}H NMR (400 MHz, [D$_6$]DMSO, 25°C, TMS)) δ/ppm = 3.84 (2 H, m, **CH$_2$**-OH), 3.50 (1 H, m, **CH**-COO$^-$), 3.42 (2 H, dd, *J* = 5.7, 4.3 Hz, N-**CH$_2$**-) 3.11 (9 H, s, -N-**CH$_3$**), 1.08 (3 H, d, *J* = 4.0 Hz, **CH$_3$**-CH-);

^{13}C NMR (101 MHz, DMSO) δ/ppm = 173.19, 68.80, 67.67, 53.55, 40.60, 40.39, 40.18, 21.73.

IR (ATR, ν_{max}, cm^{-1}): IR (ATR, ν_{max}, cm^{-1}): 3213 (m, br), 2984 (m,s), 1563 (m,s), 1484 (m,s), 1361 (m,s), 1085 (w,s), 953 (w,s);

HRMS *m/z*: Calcd for $C_5H_{14}ON^+$ 104.1075; Found 104.1076, Δ 0.9605

HRMS *m/z*: Calcd for $C_3H_5O_3^-$ 89.0239; Found 89.0237, Δ -2.2466

Cholinium salicylate [Chol][Sal]

^{1}H NMR (400 MHz, [D$_6$]DMSO, 25°C, TMS)) δ/ppm = 7.66 (1H, dd, *J* = 7.6, 1.8 Hz, **-CH**-C-COO$^-$), 7.13 (1H, ddd, *J* = 8.2, 7.2, 1.9 Hz, **-CH**-C-OH), 6.59 (1H, m, **-CH**-CH-C-), 6.58 (1H, m, CH-**CH**-CH), 3.84 (2 H, m, **CH$_2$**-OH), 3.42 (2 H, m, N-**CH$_2$**-), 3.13 (9 H, s, N-**CH$_3$**);

^{13}C NMR (101 MHz, DMSO) δ/ppm = 172.09, 163.19, 131.92, 130.42, 120.83, 116.54, 116.28, 67.52, 53.59, 40.59, 40.38, 40.18;

IR (ATR, ν_{max}, cm^{-1}): 3216 (m, br), 3026 (m, s), 1627 (m, s), 1582 (m, s), 1483 (m, s), 1454 (m, s), 1380 (m,s), 1284 (m, s), 1264 (m, s), 1206 (w, s), 1138 (w, s), 1085 (w, s), 951 (w, s), 856 (w, s), 762 (w, s), 665 (w, s);

HRMS *m/z*: Calcd for $C_5H_{14}ON^+$ 104.1075; Found 104.1077, Δ 1.9211

HRMS *m/z*: Calcd for $C_7H_5O_3^-$ 137.0232; Found 137.0236, Δ 2.9192

Cholinium saccharinate [Chol][Sacc]

^{1}H NMR (400 MHz, [D_6]DMSO, 25°C, TMS)) δ/ppm = 7.64 (1H, d, *J* = 6.5 Hz, **-CH**-C-C(=O)-), 7.59 (3H, m, **-CH-CH-CH**-C-S-), 3.84 (2 H, m, **CH_2**-OH), 3.40 (2 H, dd, *J* = 5.7, 4.2 Hz, N-**CH_2**-), 3.11 (9 H, s, N-**CH_3**);

^{13}C NMR (101 MHz, DMSO) δ/ppm = 160.83, 140.68, 137.28, 133.66, 128.12, 123.49, 121.39, 67.52, 53.68, 40.44, 40.33, 40.10;

IR (ATR, ν_{max}, cm^{-1}): 3025 (m, br), 2980 (m,s), 2920 (m,s), 2736 (m,s), 2710 (m,s), 1558 (m,s), 1491 (m,s), 1368 (m,s), 1351 (m, s), 1218 (w, s), 1066 (w,s), 957 (w,s), 925 (w, s);

HRMS *m/z*: Calcd for $C_5H_{14}ON^+$ 104.1075; Found 104.1076, Δ 0.9605

HRMS *m/z*: Calcd for $C_7H_4NO_3S^-$ 181.9911; Found 181.9912, Δ 0.5495

Cholinium nicotinate [Chol][Nic]

^{1}H NMR (400 MHz, [D_6]DMSO, 25°C, TMS)) δ/ppm = 8.95 (1H, s, -N-**CH**-C-), 8.46 (1H, d, *J* = 7.0 Hz, **-CH**-N-CH), 8.09 (1H, d, *J* = 6.9 Hz, -CH-**CH**-C-), 7.30 (1H, t, *J* = 6.1 Hz, CH-**CH**-CH), 3.83 (2 H, m, **CH_2**-OH), 3.42 (2 H, dd, *J* = 5.5, 4.3 Hz, N-**CH_2**-), 3.12 (9 H, s, N-**CH_3**);

^{13}C NMR (101 MHz, DMSO) δ/ppm = 166.33, 151.68, 150.28, 138.18, 126.66, 123.66, 67.62, 53.60, 40.57, 40.36, 40.15;

IR (ATR, ν_{max}, cm^{-1}): 3232 (m, br), 3031 (m,s), 1605 (m,s), 1549 (m,s), 1481 (m,s), 1345 (m,s), 1057 (w,s), 953 (w,s); 724 (w,s), 679 (w,s);

HRMS *m/z*: Calcd for $C_5H_{14}ON^+$ 104.1075; Found 104.1073, Δ -1.9211

HRMS *m/z*: Calcd for $C_6H_4NO_2^-$ 122.0242; Found 104122.0243, Δ 0.8195

Cholinium isonicotinate [Chol][Iso]

^{1}H NMR (400 MHz, [D_6]DMSO, 25°C, TMS)) δ/ppm = 8.49 (2H, d, *J* = 6.7 Hz, -N**-CH**-), 7.65 (2H, d, *J* = 6.6 Hz, **-CH**-C-COO^-), 3.86 (2 H, m, **CH_2**-OH), 3.45 (2 H, dd, *J* = 5.4, 4.3 Hz,N-**CH_2**-), 3.13 (9 H, s, N-**CH_3**);

^{13}C NMR (101 MHz, DMSO) δ/ppm = 167.83, 149.68, 148.28, 123.66, 67.62, 53.60, 40.57, 40.36, 40.15;

IR (ATR, ν_{max}, cm^{-1}): 3247 (m, br), 3023 (m,s), 1599 (m,s), 1545 (m,s), 1478 (m,s), 1362 (m,s), 1056 (w,s), 953 (w,s); 726 (w,s), 671 (w,s);

HRMS *m/z*: Calcd for $C_5H_{14}ON^+$ 104.1075; Found 104.1072, Δ -2.8816

HRMS *m/z*: Calcd for $C_6H_4NO_2^-$ 122.0242; Found 122.0246, Δ 3.2780

Cholinium 2,6-dichloroisonicotinate [Chol][Ina]

^{1}H NMR (400 MHz, [D$_6$]DMSO, 25°C, TMS)) δ/ppm = 7.65 (2H, s, **-CH**-C-COO$^-$), 3.84 (2 H, m, **CH$_2$**-OH), 3.41 (2 H, dd, *J* = 5.6, 4.5 Hz, N-**CH$_2$**-), 3.11 (9 H, s, N-**CH$_3$**);

^{13}C NMR (101 MHz, DMSO) δ/ppm = 164.08, 155.28, 149.43, 123.33, 67.48, 53.60, 40.61, 40.40, 40.19;

IR (ATR, ν_{max}, cm^{-1}): 3233 (m, br), 2961 (w,s), 1616 (m,s), 1541 (m,s), 1481 (m,s), 1344 (m,s), 1148 (w,s), 1097 (m,s), 952 (w,s), 786 (ms,), 725 (m,s)

HRMS *m/z*: Calcd for $C_5H_{14}ON^+$ 104.1075; Found 104.1073, Δ -1.8250

HRMS *m/z*: Calcd for $C_6H_2Cl_2NO_2^-$ 189.9462; Found 189.9461, Δ -0.5265

Cholinium pipecolate [Chol][Pip]

^{1}H NMR (400 MHz, [D$_6$]DMSO, 25°C, TMS)) δ/ppm = 3.84 (2 H, m, **CH$_2$**-OH), 3.42 (2 H, dd, *J* = 5.4, 4.3 Hz, N-**CH$_2$**-), 3.12 (9 H, s, N-**CH$_3$**), 2.90 (1 H, dd, *J* = 6.4, 5.9 Hz, -**CH**-COO$^-$), 2.61 (1 H, dd, *J* = 5.8, 5.1 Hz, **CH$_2$**-CH-COO$^-$), 2.44 (1 H, dd, *J* = 5.7, 5.0 Hz, **CH$_2$**-CH-COO$^-$) 1.77 (1 H, dd, *J* = 5.2, 4,3 Hz, .-**CH$_2$**-NH-), 1.64 (1 H, dd, *J* = 5.2, 4.2 Hz,-**CH$_2$**-NH-), 1.41 (1 H, dd, *J* = 5.0, 4.0 Hz, -**CH$_2$-**CH$_2$-NH-), 1.21 (3 H, m, **-CH$_2$-CH$_2$-**CH$_2$-NH-);

^{13}C NMR (101 MHz, DMSO) δ/ppm = 176.19, 67.67, 55.43, 53.55, 49.00, 40.60, 40.39, 40.18, 39.34, 30.38, 26.79.

IR (ATR, ν_{max}, cm^{-1}): 3214 (m, br), 2927 (m,s), 1579 (m,s), 1481 (m,s), 1394 (m,s), 1302 (m,s), 1038 (w,s), 954 (w,s)

HRMS *m/z*: Calcd for $C_5H_{14}ON^+$ 104.1075; Found 104.1071, Δ -3.8422

HRMS *m/z*: Calcd for $C_6H_{10}NO_2^-$ 128.0711; Found 128.0710, Δ -0.7808

Cholinium α-aminobutyrate [Chol][AABA]

^{1}H NMR (400 MHz, [D$_6$]DMSO, 25°C, TMS)) δ/ppm = 3.85 (2 H, m, **CH$_2$**-OH), 3.44 (2 H, dd, *J* = 5.8, 4.1 Hz, N-**CH$_2$**-), 3.14 (9 H, s, N-**CH$_3$**), 2.74 (1 H, d, *J* = 2.2 Hz, **CH**-NH$_2$), 1.51 (1 H, dd, *J* = 7.6, 5.0 Hz, **CH$_2$**-CH$_3$), 1.27 (1 H, m, **CH$_2$**-CH$_3$), 0.79 (3 H, t, *J* =6.1,-**CH$_3$**);

^{13}C NMR (101 MHz, DMSO) δ/ppm = 162.37, 67.71, 53.55, 40.59, 40.38, 40.17, 29.32, 25.76, 10.60;

IR (ATR, ν_{max}, cm^{-1}): 3253 (m, br), 2964 (m,s), 1565 (m,s), 1476 (m,s), 1388 (m,s), 1087 (w,s), 953 (w,s)

HRMS *m/z*: Calcd for $C_5H_{14}ON^+$ 104.1075; Found 104.1071, Δ -3.8422

HRMS *m/z*: Calcd for $C_4H_8NO_2^-$ 102.0555; Found 102.0554, Δ -0.9799

Cholinium β-aminobutyrate [Chol][BABA]

^{1}H NMR (400 MHz, [D$_6$]DMSO, 25°C, TMS)) δ/ppm = 3.85 (2 H, m, **CH$_2$**-OH), 3.43 (2 H, m, N-**CH$_2$**-), 3.13 (9 H, s, N-**CH$_3$**), 2.99 (1 H, m, **CH**-NH$_2$), 1.90 (1 H, d, *J* = 4.4 Hz, -**CH$_2$**-CH), 1.76 (1 H, dd, *J* = 14.4, 8.7 Hz, **CH$_2$**-CH), 0.89 (3 H, d, *J* = 6.4 Hz, -**CH$_3$**);

^{13}C NMR (101 MHz, DMSO) δ/ppm = 175.34, 67.68, 53.58, 45.21, 40.60, 40.39, 40.18, 39.97, 39.35

IR (ATR, ν_{max}, cm^{-1}): 3257 (m, br), 2962 (m,s), 1560 (m,s), 1477 (m,s), 1389 (m,s), 1087 (w,s), 953 (w,s)

HRMS *m/z*: Calcd for $C_5H_{14}ON^+$ 104.1075; Found 104.1074, Δ -0.9605

HRMS *m/z*: Calcd for $C_4H_8NO_2^-$ 102.0555; Found 102.0556, Δ 0.9799

Cholinium γ-aminobutyrate [Chol][GABA]

^{1}H NMR (400 MHz, [D$_6$]DMSO, 25°C, TMS)) δ/ppm = 3.84 (2 H, m, **CH$_2$**-OH), 3.42 (2 H, m, N-**CH$_2$**-), 3.13 (9 H, s, -N-**CH$_3$**), 2.47 (2 H, dt, *J* = 13.9, 4.3 Hz, -**CH$_2$**-COO$^-$), 1.85 (2 H, t, *J* = 7.3 Hz, -**CH$_2$**-NH$_2$), 1.48 (1 H, m, -**CH$_2$**-CH$_2$);

^{13}C NMR (101 MHz, DMSO) δ/ppm = 178.42, 67.64, 53.52, 41.21, 40.63, 40.39, 40.16, 35.97, 24.35;

IR (ATR, ν_{max}, cm^{-1}): 3220 (m, br), 2970 (m,s), 1561 (m,s), 1476 (m,s), 1385 (m,s), 1086 (w,s), 953 (w,s);

HRMS *m/z*: Calcd for $C_5H_{14}ON^+$ 104.1075; Found 104.1078, Δ 2.8816

HRMS *m/z*: Calcd for $C_4H_8NO_2^-$ 102.0555; Found 102.0554, Δ -0.9799

Cholinium 3-aminopropanoate [Chol][ALA]

^{1}H NMR (400 MHz, [D$_6$]DMSO, 25°C, TMS)) δ/ppm = 3.84 (2 H, td, *J* = 5.0, 2.7 Hz, **CH$_2$**-OH), 3.43 (2 H, m, N-**CH$_2$**-), 3.13 (9 H, s, -N-**CH$_3$**), 2.57 (2 H, t, *J* = 6.4 Hz, -**CH$_2$**-COO$^-$), 1.94 (2 H, t, *J* = 6.4 Hz, -**CH$_2$**-NH$_2$);

^{13}C NMR (101 MHz, DMSO) δ/ppm = 175.78, 67.73, 53.54, 48.96, 42.20, 40.59, 40.38, 40.17;

IR (ATR, ν_{max}, cm^{-1}): 3187 (m, br), 2960 (m,s), 1561 (m,s), 1478 (m,s), 1377 (m,s), 1056 (w,s), 953 (w,s);

HRMS *m/z*: Calcd for $C_5H_{14}ON^+$ 104.1075; Found 104.1079, Δ 3.8422

HRMS *m/z*: Calcd for $C_3H_6NO_2^-$ 88.0398; Found 88.0397, Δ -1.1358

Purification

Presented synthetic pathways were generally based on extraction or precipitation methods, where mostly inorganic side products were filtered from organic phase with product (NaCl) or evaporated (H_2O). In the stage, when impurities could contain halides, purity was determined by reaction with acidic solution of $AgNO_3$ in order to define their concentration at level below 500 ppm. Next, solvents were evaporated from purified salts and obtained solids or liquids were dried under high vacuum (0,01 mBar) for 24 to 48 hours for the purification from water traces. Finally, of all of synthesized compounds were directed to NMR analysis for determination of exact ions ratio and lack of traces of organic impurities. Because of ionic character of prepared compounds and their melting points often below 100 °C, samples were not crystalline, rather oils. Other impurities have not been analysed because of the lack of significance for biological tests, especially in used concentrations.

PURITY AND PHYSICAL PROPERTIES EVALUATION:

New cholinium-based ionic liquids were characterized using Nuclear Magnetic Resonance. The methods for obtaining thermal, spectroscopic and others data are described below.

Thermal analysis

Differential Scanning Calorymetry (DSC)

Melting points were determined using DSC method in STAR^e System (Mettler Toledo). Samples used were between 6 – 15 mg, closed in aluminum pans and stored under argon atmosphere (flow rate: 20 ml/min).

In the first heating cycle the heating ramp was set from 25 to 160°C (310°C in case of cholinium chloride) with heating rate 2.5°C/min. At this temperature samples were held for a 5 minutes isotherm. In the next step samples were cooled from 160°C (310°C in case of cholinium chloride) to -70°C with cooling rate 2.5°C /min, and then were kept for 5 min at -70°C. The last step was heating sample from -70°C back to 160°C (310°C in case of cholinium chloride, as described above) with heating rate 2.5°C/min.

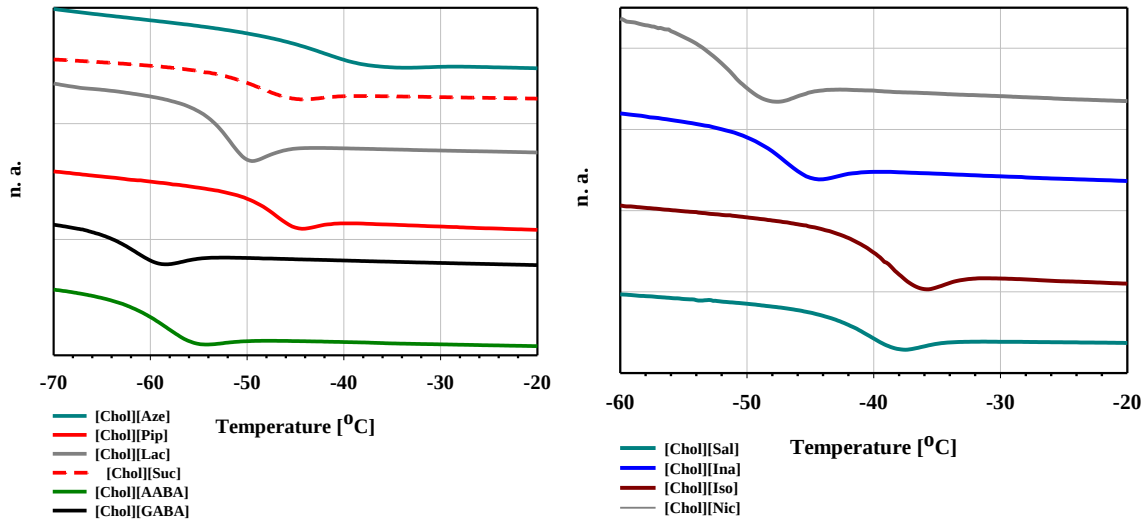

Figure S1. Glass transitions

Thermogravimetric Analysis (TGA)

Thermogravimetric analyses were performed on TGA Q50 Texas Instrument. Samples between 5 and 10 mg were heated form 25°C to 500°C with heating rate of 10°C/min with a 10 min isotherm at 85°C under nitrogen atmosphere. This isotherm step was intended to remove any remaining water and possible volatile impurities present in the samples. Decomposition temperatures reported for all materials were established as the onset temperature for decomposition of the first 5% of the sample ($T_{5\%onset}$), and as the regular onset temperature for decomposition (T_{onset}), either for the whole sample or for each of the consecutive steps in stepwise decomposition.

Dissolution rate

To determine dissolution rate the system for continuous flow measurement of absorbance of tested substances was constructed and used. For every compound, characteristic wavelength (Table S1) at which the absorbance of compound was at the maximum, was determined by UV-Vis. Following this step, salt samples of the tested compounds (the mass of each sample between 8 and 10 mg, below maximum solubility) were placed in the mashed cellulose bag in conical flask filed with 140 cm^3 of distilled water with magnetic stirrer (250 rpm). Using peristaltic pump Heidolph PD 5101 the solution from the flask, where the dissolution experiment was conducted, was transferred to the UV spectrometer (Merck Spectroquant® Pharo 300) and after passing through the UV cell, back to the experiment flask in order to form a closed system. The absorbance of the solution was measured constantly at the wavelength earlier determined as maximum absorption for particular compound. Each experiment was carried until all tested sample was completely dissolved. The results are shown in graphs where x-axis represents dissolution time and y-axis

is % of absorbance of compound (100% absorbance is absorbance of fully dissolved compound). All tests were performed at 25°C.

Table S1. Characteristic wavelength with maximum absorbance for determination of dissolution rate.

Compound	Characteristic wavelength
[Chol][Sal]	310
[Chol][Sacc]	285
[Chol][Aze]	-
[Chol][Pip]	302
[Chol][Lac]	-
[Chol][Nic]	279
[Chol][Iso]	284
[Chol][Oxa]	-
[Chol][Suc]	-
[Chol][Ina]	292
[Chol][AABA]	287
[Chol][BABA]	287
[Chol][GABA]	287
[Chol][ALA]	287
[Chol][BTHCOO]	313

SAR induction properties.

Plants of *N. tabacum* var Xanthi, at the stage of three-developed leaves, were sprayed with 20 mL solutions of analyzed salts in water at concentration 200 mg/L and the control sprayed with distilled water that was used for the preparation of solutions of ionic liquids. Seven days later, the treated plants were infected mechanically with Tobacco mosaic virus (TMV). After the next 4-5 days a local necrotic spots, as a result of a viral infection, were counted and compared between the number of spots on the leaves treated with salt solutions and distilled water (control). Reduction in the number of necrotic spots on the leaves treated with salts, in comparison with the control, show inhibition of viral infection by induction of plant resistance through the usage of new salts. Moreover aside from the reduction in the number of local necrotic spots, in tobacco plants treated with tested compounds, also their size reduction was observed. Data were collected in three replicates and statistically subjected to the one-way analysis of variance (ANOVA).

Phytototoxicity assessment

Phytotoxicity tests were performed on *N. tabacum* var Xanthi. Plants were sprayed with water solutions (50 ml) containing active substance in concentration of 200 mg/l. Several days after treatment visual effects of used compounds on the plants were analyzed. Phytotoxicity effect was observed as yellowing of leaves surface and growth inhibition of whole plants.

References for supplementary information

[1] P. Lewandowski, R. Kukawka, H. Pospieszny, M. Smiglak, New J. Chem., 2014, 38, 1372.