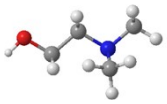
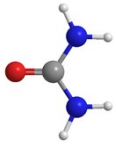
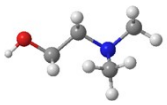
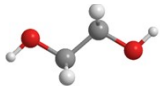
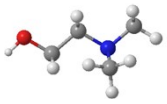
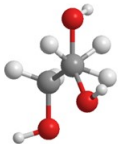
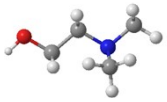
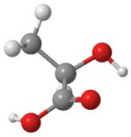
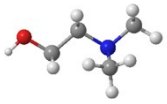
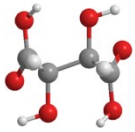
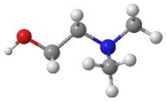
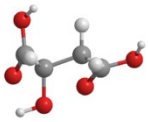
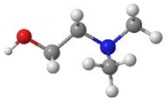
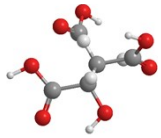
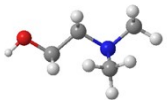
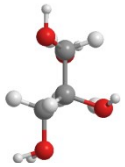
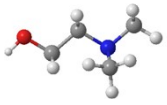
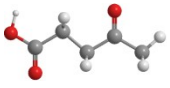
**Table. S1 Composition and abbreviation of NADESs with choline chloride as HBA studied**

| Solvent name | HBA | structural formula | HBD | structural formula | water content | Molar ratio |
|---|---|---|---|---|---|---|
| NADES-1 | Choline Chloride ($C_5H_{14}ClNO$) |  | urea ($CH_4N_2O$) |  | 20% | 1:2 |
| NADES-2 | Choline Chloride ($C_5H_{14}ClNO$) |  | glycol ($C_2H_6O_2$) |  | 20% | 1:2 |
| NADES-3 | Choline Chloride ($C_5H_{14}ClNO$) |  | glycerol ($C_3H_8O_3$) |  | 20% | 1:2 |
| NADES-4 | Choline Chloride ($C_5H_{14}ClNO$) |  | lactic acid ($C_3H_6O_3$) |  | 20% | 1:2 |
| NADES-5 | Choline Chloride ($C_5H_{14}ClNO$) |  | tartaric acid ($C_4H_6O_6$) |  | 20% | 1:2 |
| NADES-6 | Choline Chloride ($C_5H_{14}ClNO$) |  | malic acid ($C_4H_6O_5$) |  | 20% | 1:2 |
| NADES-7 | Choline Chloride ($C_5H_{14}ClNO$) |  | citric acid ($C_6H_8O_7$) |  | 20% | 1:2 |
| NADES-8 | Choline Chloride ($C_5H_{14}ClNO$) |  | aditol ($C_5H_{12}O_5$) |  | 20% | 1:2 |
| NADES-9 | Choline Chloride |  | levulinic acid |  | 20% | 1:2 |

($C_5H_{14}ClNO$) ($C_5H_8O_3$)

**Table. S2 Composition and abbreviation of NADESs with Betaine as HBA studied**

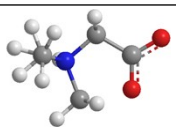
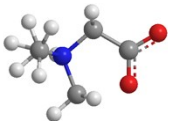
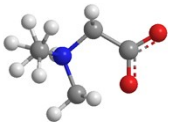
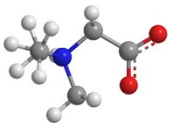
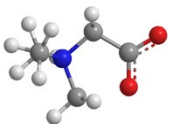
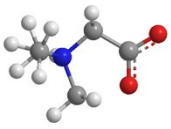
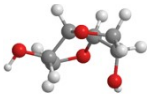
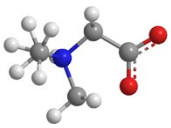
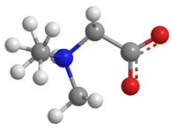
| Solvent name | HBA | structural formula | HBD | structural formula | water content | Molar ratio |
|---|---|---|---|---|---|---|
| NADES-10 | betaine ($C_5H_{11}NO_2$) |  | urea (CH4N2O) |  | 20% | 1:2 |
| NADES-11 | betaine ($C_5H_{11}NO_2$) |  | glycol ($C_2H_6O_2$) |  | 20% | 1:2 |
| NADES-12 | betaine ($C_5H_{11}NO_2$) |  | glycerol ($C_3H_8O_3$) |  | 20% | 1:2 |
| NADES-13 | betaine ($C_5H_{11}NO_2$) |  | lactic acid ($C_3H_6O_3$) |  | 20% | 1:2 |
| NADES-14 | betaine ($C_5H_{11}NO_2$) |  | citric acid ($C_6H_8O_7$) |  | 20% | 1:2 |
| NADES-15 | betaine ($C_5H_{11}NO_2$) |  | isosorbitol ($C_6H_{10}O_4$) |  | 20% | 1:2 |
| NADES-16 | betaine ($C_5H_{11}NO_2$) |  | butanediol ($C_4H_{10}O_2$) |  | 20% | 1:2 |

**Table. S3 Composition and abbreviation of NADESs with Proline as HBA studied**

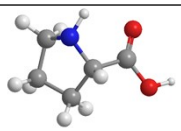
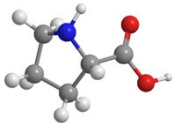
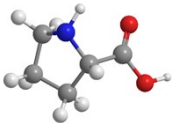
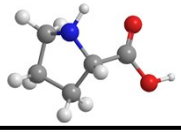
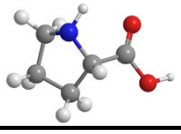
| Solvent name | HBA | structural formula | HBD | structural formula | water content | Molar ratio |
|---|---|---|---|---|---|---|
| NADES-17 | proline ($C_5H_9NO_2$) |  | urea ($CH_4N_2O$) | | 20% | 1:2 |
| NADES-18 | proline ($C_5H_9NO_2$) |  | lactic acid ($C_3H_6O_3$) |  | 20% | 1:2 |
| NADES-19 | proline ($C_5H_9NO_2$) |  | citric acid (C6H8O7) |  | 20% | 1:2 |

**Table.S4 Response factor flat design**

| Flat | A extraction time (min) | B extraction temperature (℃) | C liquid-solid ratio (g/g) |
|---|---|---|---|
| -1 | 20 | 55 | 1:50 |
| 0 | 30 | 60 | 1:60 |
| 1 | 40 | 65 | 1:70 |

**Table. S5 Main components of CGT**

| Number | Compound | Structural Formula | Molecular Weight | Adduct/Charge | CAS | Top5 Peaks |
|---|---|---|---|---|---|---|
| 1 | naringenin | $C_{15}H_{12}O_5$ | 272.25 | $[M-H]^-$ | 480-41-1 | 119.051 999<br>151.005 746<br>107.014 257<br>271.065 72<br>120.055 50 |
| 2 | apigenin | $C_{15}H_{10}O_5$ | 270.24 | $[M+H]^+$ | 520-36-5 | 271.0601 999<br>158.0122 1 |
| 3 | quinic acid | $C_7H_{12}O_6$ | 192.17 | $[M-H]^-$ | 7729-33-1 | 191.3 999<br>96.9 2<br>155.2 1<br>59.3 1<br>146.9 1 |
| 4 | pulegone | $C_{10}H_{16}O$ | 152.23 | — | 89-82-7 | — |
| 5 | 7-Hydroxycoumarin | $C_9H_6O_3$ | 162.14 | $[M+H]^+$ | 93-35-6 | 161.0246 999<br>162.0276 72<br>700.0316 35<br>133.0296 18<br>701.035 13 |

**Table S5**.Cont

| Number | Compound | Structural Formula | Molecular Weight | Adduct/Charge | CAS | Top5 Peaks |
|---|---|---|---|---|---|---|
| 6 | stachydrine | $C_7H_{13}NO_2$ | 143.18 | $[M+H]^+$ | 471-87-4 | 144.1027 100<br>145.1055 7.61 |
| 7 | adenosine | $C_{10}H_{13}N_5O_4$ | 267.24 | $[M+H]^+$ | 58-61-7 | 136.0615 999<br>57.0335 28<br>119.0343 22<br>85.0284 16<br>55.019 15 |
| 8 | eriodictyol | $C_{15}H_{12}O_6$ | 288.25 | $[M+H]^+$ | 552-58-9 | 163.1048 48.38<br>153.1417 15.61<br>179.1492 12.99<br>271.0828 9.66<br>253.1415 2.89 |
| 9 | pinocembrin | $C_{15}H_{12}O_4$ | 256.25 | $[M+K]^+$ | 480-39-7 | 255.0662 100<br>213.0554 1.23<br>151.0037 0.92<br>171.0446 0.51<br>211.0757 0.51 |
| 10 | citric acid | $C_6H_8O_7$ | 191.12 | $[M-H]^-$ | 77-92-9 | 41.0034 999 |

**Table S5**.Cont

| Number | Compound | Structural Formula | Molecular Weight | Adduct/Charge | CAS | Top5 Peaks |
|---|---|---|---|---|---|---|
| 11 | osthole | $C_{15}H_{16}O_3$ | 244.28 | $[M+H]^+$ | 484-12-8 | 189.05472 999<br>131.0488 385<br>245.11761 240<br>190.05887 128<br>103.05485 57 |
| 12 | guanine | $C_5H_5N_5O$ | 151.13 | $[M+NH_4]^+$ | 73-40-5 | 174.0345 999 |
| 13 | phenprobamate | $C_{10}H_{13}NO_2$ | 179.22 | $[M-H]^-$ | 673-31-4 | 91 999<br>92 67<br>89 59<br>133 55<br>149 35 |
| 14 | L-Malic acid | $C_4H_6O_5$ | 134.09 | $[M-H]^-$ | 97-67-6 | 115.0028 999<br>133.0137 530<br>71.0146 348<br>72.9935 129<br>89.0249 59 |
| 15 | berberine | $C_{20}H_{18}NO_4^+$ | 336.39 | $[M+H]^+$ | 2086-83-1 | 336.1239 999<br>337.1269 199<br>338.1297 29 |

**Table S5**.Cont

| Number | Compound | Structural Formula | Molecular Weight | Adduct/Charge | CAS | Top5 Peaks |
|---|---|---|---|---|---|---|
| 16 | kaempferol | $C_{15}H_{10}O_6$ | 286.24 | $[M+H]^+$ | 520-18-3 | 287.0549 999<br>289.0609 9<br>286.0467 1 |
| 17 | adenine | $C_5H_5N_5$ | 135.13 | $[M+H]^+$ | 73-24-5 | 136.061216 999<br>137.064083 46<br>137.045293 22<br>119.035071 16<br>137.058627 12 |
| 18 | esculin | $C_{15}H_{16}O_9$ | 340.28 | $[M+H]^+$ | 531-75-9 | 179.0307 100<br>123.0424 49.81<br>133.0298 24.33<br>163.0328 13.79<br>134.0268 13.70 |
| 19 | tanshinone IIA | $C_{19}H_{18}O_3$ | 294.3 | $[M+H]^+$ | 568-72-9 | 295.2 999<br>295.1 887<br>294.8 868<br>294.9 850<br>295 837 |

**Table S5**.Cont

| Number | Compound | Structural Formula | Molecular Weight | Adduct/Charge | CAS | Top5 Peaks |
|---|---|---|---|---|---|---|
| 20 | perillaldehyde | $C_{10}H_{14}O$ | 150.22 | $[M+H]^+$ | 2111-75-3 | 68.0 99.99<br>79.0 51.31<br>67.0 43.14<br>107.0 42.21<br>93.0 27.85 |
| 21 | D-sucrose | $C_{12}H_{22}O_{11}$ | 342.3 | $[M-H]^-$ | 57-50-1 | 341.1084 999<br>71.0149 800<br>89.0247 687<br>101.0245 569<br>179.0558 490 |
| 22 | angelicin | $C_{11}H_6O_3$ | 186.16 | $[M+H]^+$ | 523-50-2 | 187 999<br>186.9 506<br>186.8 436<br>186.7 428<br>186.6 393 |
| 23 | 4-Hydroxycinnamic acid | $C_9H_8O_3$ | 164.16 | $[M-H]^-$ | 7400-08-0 | 147.0435 999<br>165.0541 223<br>148.0471 66<br>119.0481 8<br>91.0534 6 |

**Table S5**.Cont

| Number | Compound | Structural Formula | Molecular Weight | Adduct/Charge | CAS | Top5 Peaks |
|---|---|---|---|---|---|---|
| 24 | isorhamnetin | $C_{16}H_{12}O_7$ | 316.26 | $[M+H]^+$ | 480-19-3 | 153.0191 999 |
| | | | | | | 217.0489 626 |
| | | | | | | 203.034 548 |
| | | | | | | 245.0434 352 |
| | | | | | | 69.0009 313 |
| 25 | guanosine | $C_{10}H_{13}N_5O_5$ | 283.24 | $[M+H]^+$ | 118-00-3 | 152.0535 999 |
| | | | | | | 135.0266 131 |
| | | | | | | 110.0321 27 |
| | | | | | | 109.0463 14 |
| | | | | | | 153.0606 10 |
| 26 | L-asparagine | $C_4H_8N_2O_3$ | 132.12 | $[M+H]^+$ | 70-47-3 | 74.024 999 |
| | | | | | | 87.0554 291 |
| | | | | | | 70.0303 193 |
| | | | | | | 133.0612 136 |
| | | | | | | 46.0294 124 |

**Table S5**.Cont

| Number | Compound | Structural Formula | Molecular Weight | Adduct/Charge | CAS | Top5 Peaks |
|---|---|---|---|---|---|---|
| 27 | esculetin | $C_9H_6O_4$ | 178.14 | $[M-H]^-$ | 305-01-1 | 177.0214 999 |
| | | | | | | 133.0308 919 |
| | | | | | | 89.0399 766 |
| | | | | | | 105.0354 720 |
| | | | | | | 77.0396 335 |
| 28 | gluconic acid | $C_6H_{12}O_7$ | 196.16 | $[M-H]^-$ | 526-95-4 | 195.2 999 |
| | | | | | | 128.9 17 |
| | | | | | | 177 7 |
| | | | | | | 151.1 6 |
| | | | | | | 159 2 |
| 29 | camphor | $C_{10}H_{16}O$ | 152.23 | $[M+H]^+$ | 464-48-2 | 153.1273765 999 |

**Table S5**.Cont

| Number | Compound | Structural Formula | Molecular Weight | Adduct/Charge | CAS | Top5 Peaks |
|---|---|---|---|---|---|---|
| 30 | hesperetin | $C_{16}H_{14}O_6$ | 302.28 | $[M+H]^+$ | 520-33-2 | 177.0546 51.56 |
| | | | | | | 179.0338 22.51 |
| | | | | | | 285.0759 9.02 |
| | | | | | | 153.0184 8.30 |
| | | | | | | 261.0758 2.31 |
| 31 | linoleic acid | $C_{18}H_{32}O_2$ | 280.4 | $[M-H]^-$ | 60-33-3 | 279.2316 999 |
| | | | | | | 217.1581 8 |
| | | | | | | 261.2237 3 |
| 32 | isoscopoletin | $C_{10}H_8O_4$ | 192.17 | $[M-H]^-$ | 776-86-3 | 192 999 |
| | | | | | | 149 567 |
| | | | | | | 164 365 |
| | | | | | | 69 272 |
| | | | | | | 51 181 |
| 33 | xanthotoxol | $C_{11}H_6O_4$ | 202.16 | — | 2009-24-7 | — |

**Table S5**.Cont

| Number | Compound | Structural Formula | Molecular Weight | Adduct/Charge | CAS | Top5 Peaks |
|---|---|---|---|---|---|---|
| 34 | L(+)-arginine | $C_6H_{14}N_4O_2$ | 174.20 | $[M+H]^+$ | 74-79-3 | 116.0732 999 |
| | | | | | | 130.1002 581 |
| | | | | | | 175.1229 169 |
| | | | | | | 158.0952 167 |
| | | | | | | 55.0548 51 |
| 35 | liquiritin | $C_{21}H_{22}O_9$ | 418.4 | $[M+H]^+$ | 551-15-5 | 257.08197 999 |
| | | | | | | 137.02208 150 |
| | | | | | | 258.07971 141 |
| | | | | | | 258.09116 91 |
| | | | | | | 147.04353 49 |
| 36 | maleic acid | $C_4H_4O_4$ | 116.07 | $[M-H]^-$ | 110-16-7 | 114.9 999 |
| | | | | | | 70.9 227 |
| | | | | | | 96.8 1 |
| | | | | | | 114 1 |
| | | | | | | 59 1 |

**Table S5**.Cont

| Number | Compound | Structural Formula | Molecular Weight | Adduct/Charge | CAS | Top5 Peaks |
|---|---|---|---|---|---|---|
| 37 | furfuryl alcohol | $C_5H_6O_2$ | 98.10 | — | 98-00-0 | — |
| 40 | genistein | $C_{15}H_{10}O_5$ | 270.24 | $[M+H]^+$ | 446-72-0 | 271.0595 999<br>272.0629 155<br>223.0625 11 |
| 41 | cinnamyl alcohol | $C_9H_{10}O$ | 134.17 | — | 104-54-1 | — |
| 42 | scopoletin | $C_{10}H_8O_4$ | 192.17 | $[M-H]^-$ | 92-61-5 | 104.0269 999<br>120.0223 840<br>148.0136 445 |
| 43 | carvone | $C_{10}H_{14}O$ | 150.22 | — | 99-49-0 | — |
| 44 | L-pyroglutamic acid | $C_5H_7NO_3$ | 129.11 | $[M-H]^-$ | 98-79-3 | 128.0348 100 |

Note: ‘-’indicatesthatthecomponentwasnotdetected

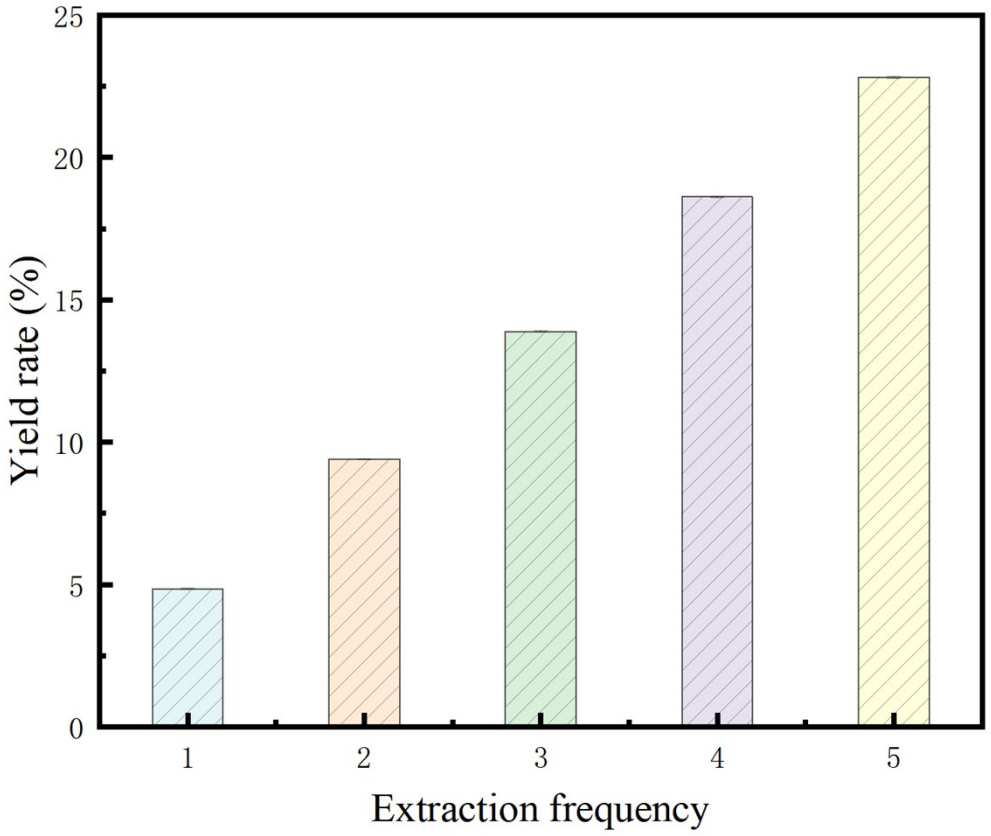



**Fig. S1** Yield of naringin under different extraction frequency

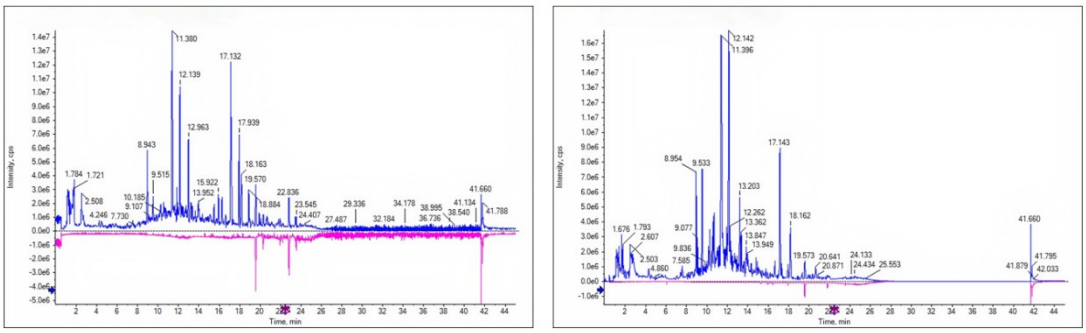


**Fig. S2** The total ion chromatograms (TICs) of the extraction from CGT

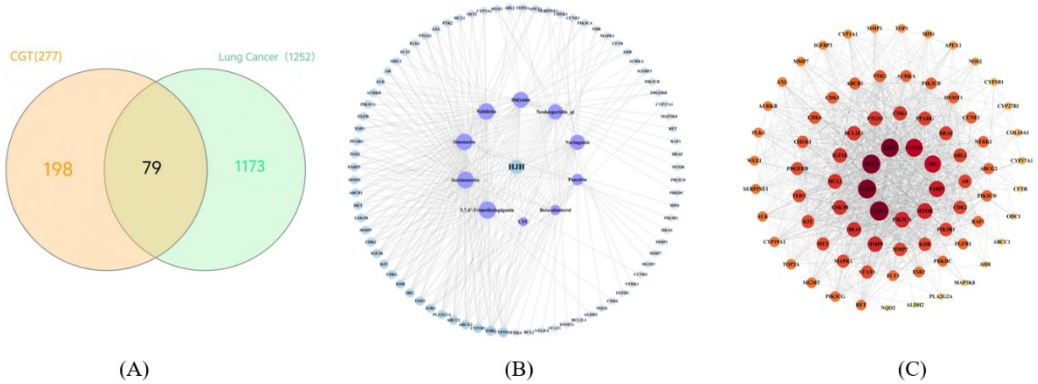



**Fig. S3** (A) Intersection targets of components from CGT and lung cancer(B) Network analysis diagram of "drug-component-core target" interaction(C) PPI network of the intersection targets

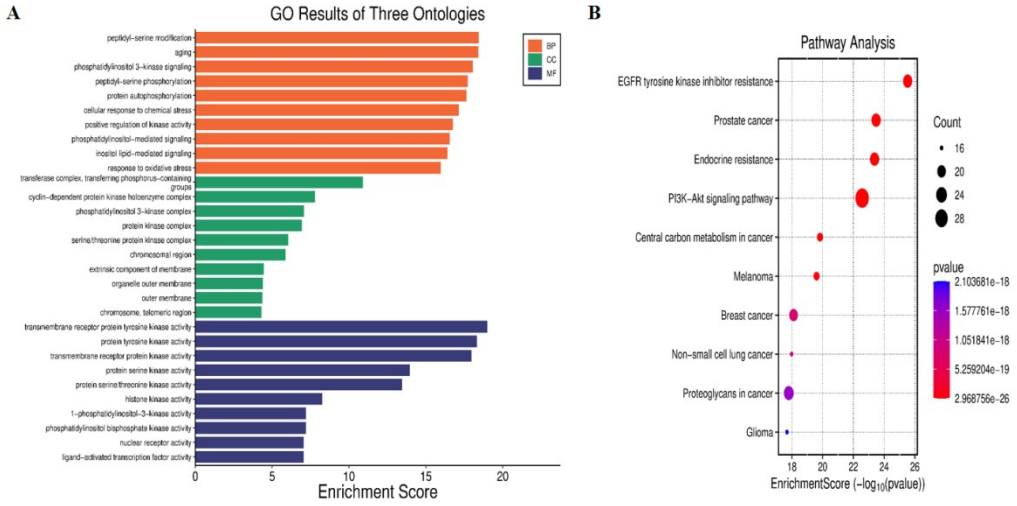



**Fig. S4** A: Results of the top 20 GO enrichments; B: The top 20 pathways enriched by KEGG. The length of the bar represents the number of genes enriched in the GO terms. The bluer the color, the smaller the P-value; the larger the dot size, the more genes are enriched in the corresponding entries.