**Table S1 Strains, accession numbers and phenotypes**

|  |  |  |  |
| --- | --- | --- | --- |
| **Strain** | **ID on trees** | **Accession Number** | **Phenotype****and referencea** |
| **Finished Genomes** |
| [Escherichia coli 042](http://www.ncbi.nlm.nih.gov/bioproject/40647) | Eco042  | [FN554766](http://www.ncbi.nlm.nih.gov/nuccore/FN554766) | EAEC ([Crossman, et al. 2010](#_ENREF_6)) |
| [Escherichia coli 536](http://www.ncbi.nlm.nih.gov/bioproject/16235) | Eco536  | NC\_008253.1 | ExPec UTI ([Zhou, et al. 2010](#_ENREF_38)) |
| Escherichia coli 53638 | Eco53638 | AAKB00000000 | EIEC JCVI (http://gsc.jcvi.org/projects/msc/e\_coli\_and\_shigella/escherichia\_coli\_53638/index.shtml) |
| [Escherichia coli 55989](http://www.ncbi.nlm.nih.gov/bioproject/33413) | Eco55989 | [NC\_011748.1](http://www.ncbi.nlm.nih.gov/nuccore/NC_011748.1) | EAEC ([Sims and Kim 2011b](#_ENREF_27)) |
| [Escherichia coli ABU 83972](http://www.ncbi.nlm.nih.gov/bioproject/38725) | EcoABU83972 | [CP001671](http://www.ncbi.nlm.nih.gov/nuccore/CP001671) | ExPec UTI ([Zdziarski, et al. 2010](#_ENREF_37)) |
| [Escherichia coli APEC O1](http://www.ncbi.nlm.nih.gov/bioproject/16718) | EcoAPEC01 | [NC\_008563.1](http://www.ncbi.nlm.nih.gov/nuccore/NC_008563.1) | ExPec From bird ([Johnson, et al. 2007](#_ENREF_12)) ([Zhou, et al. 2010](#_ENREF_38)) |
| Escherichia coli APEC 0[78](http://www.ncbi.nlm.nih.gov/bioproject/16718) | EcoAPEC078 | NC\_020163.1 | APEC ([Mangiamele, et al. 2013](#_ENREF_17))) |
| [Escherichia coli ATCC 8739](http://www.ncbi.nlm.nih.gov/bioproject/18083) | EcoATCC8739 | [NC\_010468.1](http://www.ncbi.nlm.nih.gov/nuccore/NC_010468.1) | Commensal ([Archer, et al. 2011](#_ENREF_3)) |
| [Escherichia coli B str. REL606](http://www.ncbi.nlm.nih.gov/bioproject/18281) | EcoB\_REL606 | [NC\_012967.1](http://www.ncbi.nlm.nih.gov/nuccore/NC_012967.1) | Commensal ([Sims and Kim 2011a](#_ENREF_26)) |
| [Escherichia coli 'BL21-Gold(DE3)pLysS AG'](http://www.ncbi.nlm.nih.gov/bioproject/30681) | EcoBL21-Gold | [NC\_012947.1](http://www.ncbi.nlm.nih.gov/nuccore/NC_012947.1) | Commensal  |
| [Escherichia coli BL21(DE3)](http://www.ncbi.nlm.nih.gov/bioproject/28965) | EcoBL21DE3 | [AM946981](http://www.ncbi.nlm.nih.gov/nuccore/AM946981) | Commensal ([Sims and Kim 2011a](#_ENREF_26)) |
| [Escherichia coli BW2952](http://www.ncbi.nlm.nih.gov/bioproject/33775) | EcoBW2952 | [NC\_012759.1](http://www.ncbi.nlm.nih.gov/nuccore/NC_012759.1) | Commensal ([Ferenci, et al. 2009](#_ENREF_7)) |
| Escherichia coli CFT073 | EcoCFT073 | [NC\_004431.1](http://www.ncbi.nlm.nih.gov/nuccore/NC_004431.1) | ExPec ([Zhou, et al. 2010](#_ENREF_38)) |
| Escherichia coli str. 'clone D i2' | EcoCloneDi2 | CP002212 | ExPec UPEC ([Reeves, et al. 2011](#_ENREF_24)) |
| Escherichia coli str. 'clone D i14' | EcoCloneDi14 | CP002212 | ExPec UPEC ([Reeves, et al. 2011](#_ENREF_24)) |
| Escherichia coli DH1 | EcoDH1  | [CP001637](http://www.ncbi.nlm.nih.gov/nuccore/CP001637) | Commensal ([Suzuki, et al. 2011](#_ENREF_28)) |
| Escherichia coli E24377A | EcoE24377A | [NC\_009801.1](http://www.ncbi.nlm.nih.gov/nuccore/NC_009801.1) | ETEC |
| Escherichia coli ED1a | EcoED1a | NC\_011745.1 | Commensal ([Zhou, et al. 2010](#_ENREF_38)) |
| Escherichia coli ETEC H10407 | EcoETEC\_H10407 | FN649414 | ETEC ([Zhou, et al. 2010](#_ENREF_38)) |
| Escherichia coli HS | EcoHS  | NC\_009800.1 | Commensal ([Zhou, et al. 2010](#_ENREF_38)) |
| Escherichia coli IAI1 | EcoIAI1 | NC\_011741.1 | Commensal ([Zhou, et al. 2010](#_ENREF_38)) |
| Escherichia coli IAI39 | EcoIAI39 | NC\_011750.1 | ExPec UPEC ([Touchon, et al. 2009](#_ENREF_30); [Zhou, et al. 2010](#_ENREF_38)) |
| Escherichia coli IHE3034 | EcoIHE3034 | CP001969 | ExPec Neonatal meningitis ([Moriel, et al. 2010](#_ENREF_19)) |
| Escherichia coli str. K-12 substr. DH10B | EcoK12\_DH10B | NC\_010473.1 | Commensal ([Zhou, et al. 2010](#_ENREF_38)) |
| Escherichia coli str. K-12 substr. MDS42 | EcoK12\_MDS42 | NC\_020518.1 | Commensal  |
| Escherichia coli str. K-12 substr. MG1655 | EcoK12\_MG1655 | NC\_000913.2 | Commensal ([Sims and Kim 2011b](#_ENREF_27)) |
| Escherichia coli str. K-12 substr. W3110 | EcoK12\_W3110 | AP009048 | Commensal ([Sims and Kim 2011a](#_ENREF_26)) |
| Escherichia coli KO11FL | EcoKO11FL | CP002516 | Commensal ([Turner, et al. 2012](#_ENREF_31)) |
| Escherichia coli LF82 | EcoLF82 | CU651637 | AIEC ([Wine, et al. 2009](#_ENREF_33)) |
| Escherichia coli NA114 | EcoNA114 | CP002797 | ExPec UPEC ([Avasthi, et al. 2011](#_ENREF_4)) |
| Escherichia coli O103:H2 str. 12009 | EcoO103H2\_12009 | NC\_013353.1 | EHEC ([Sims and Kim 2011a](#_ENREF_26)) |
| Escherichia coli O104:H4 2009EL-2050 | EcoO104H4\_2009EL-2050 | CP003297.1 | EAEC/STEC ([Ahmed, et al. 2012](#_ENREF_1)) |
| Escherichia coli O104:H4 2009EL-2071 | EcoO104H4\_2009EL-2071 | CP003301.1 | EAEC/STEC ([Ahmed, et al. 2012](#_ENREF_1)) |
| Escherichia coliO104:H4 2011C-3493 | EcoO104H4\_2011C-3493 | CP003289.1 | EAEC/STEC ([Ahmed, et al. 2012](#_ENREF_1)) |
| Escherichia coli O111:H- str. 11128 | EcoO111H-\_11128 | NC\_013364.1 | EHEC ([Sims and Kim 2011a](#_ENREF_26)) |
| Escherichia coli O127:H6 str. E2348/69 | EcoO127H6\_E2348\_ | NC\_011601.1 | EPEC ([Zhou, et al. 2010](#_ENREF_38)) |
| Escherichia coli O157:H7 str. EC4115 | EcoO157H7\_EC4115 | NC\_011353.1 | EHEC ([Sims and Kim 2011a](#_ENREF_26)) |
| Escherichia coli O157:H7 str. EDL933 | EcoO157H7\_EDL933 | NC\_002655.2 | EHEC ([Sims and Kim 2011a](#_ENREF_26)) |
| Escherichia coli O157:H7 str. Sakai | EcoO157H7\_Sakai | NC\_002695.1 | EHEC ([Sims and Kim 2011a](#_ENREF_26)) |
| Escherichia coli O157:H7 str. TW14359 | EcoO157H7\_TW14359 | NC\_013008.1 | EHEC ([Sims and Kim 2011a](#_ENREF_26)) |
| Escherichia coli O157H7 str. TW14588 | EcoO157H7\_TW14588 | [CM000662.1](http://www.ncbi.nlm.nih.gov/nuccore/CM000662.1) | EHEC ([Kulasekara, et al. 2009](#_ENREF_14)) |
| Escherichia coli O26:H11 str. 11368 | EcoO26H11\_str11368 | NC\_013361.1 | EHEC ([Sims and Kim 2011a](#_ENREF_26)) |
| Escherichia coli O55:H7 str. CB9615 | EcoO55H7\_CB9615 | NC\_013941.1 | EPEC ([Zhou, et al. 2010](#_ENREF_38)) |
| Escherichia coli O55:H7 str. RM12579 | EcoO55H7\_RM12579 | [CP003109.1](http://www.ncbi.nlm.nih.gov/nuccore/CP003109.1) | EPEC ([Kyle, et al. 2012](#_ENREF_15)) |
| Escherichia coli O7:K1 str. CE10 | EcoO7K1\_CE10 | CP003034 | ExPec Neonatal meningitis Lu et al 2011 |
| Escherichia coli O83:H1 str. NRG 857C | EcoO83H1\_NRG857C | CP001855 | AIEC ([Allen, et al. 2008](#_ENREF_2)) |
| [Escherichia coli P12b](http://www.ncbi.nlm.nih.gov/genome/167?project_id=162061) | EcoP21B | [CP002291.1](http://www.ncbi.nlm.nih.gov/nuccore/CP002291.1) | ????? ([Liu, et al. 2012](#_ENREF_16)) |
| Escherichia coli S88 | EcoS88  | NC\_011742.1 | ExPec Neonatal Meningitis ([Touchon, et al. 2009](#_ENREF_30)) ([Zhou, et al. 2010](#_ENREF_38)) |
| Escherichia coli SE11 | EcoSE11 | NC\_011415.1 | Commensal ([Zhou, et al. 2010](#_ENREF_38)) |
| Escherichia coli SE15 | EcoSE15 | AP009378 | Commensal ([Toh, et al. 2010](#_ENREF_29)) |
| Escherichia coli SMS-3-5 | EcoSMS35 | NC\_010498.1 | Commensal ([Zhou, et al. 2010](#_ENREF_38)) |
| Escherichia coli UM146 | EcoUM146 | CP002167 | AIEC, Ileal Chron's Disease biopsy tissue ([Krause, et al. 2011](#_ENREF_13)) |
| Escherichia coli UMN026 | EcoUMN026 | NC\_011751.1 | ExPec UPEC ([Touchon, et al. 2009](#_ENREF_30)) ([Zhou, et al. 2010](#_ENREF_38)) |
| Escherichia coli UMNF18 | EcoUMNF18 | NZ\_AGTD01000001.1 | ETEC (([Shepard, et al. 2012](#_ENREF_25))) |
| Escherichia coli UMNK88 | EcoUMNK88 | CP002729 | ETEC ([Fernandez-Alarcon, et al. 2011](#_ENREF_8); [Shepard, et al. 2012](#_ENREF_25)) |
| Escherichia coli UTI89 | EcoUTI89 | NC\_007946.1 | ExPec UPEC ([Zhou, et al. 2010](#_ENREF_38)) |
| Escherichia coli W | EcoW  | CP002185 | Commensal |
| Escherichia coli Xuzhou21 | EcoXUZhou21 |

|  |  |
| --- | --- |
|  | CP001925.1 |

 | EHEC ([Xiong, et al. 2012](#_ENREF_34)) |
| Shigella boydii CDC 3083-94 | Shibo\_CDC3083-94 | NC\_010658.1 | ([Pupo, et al. 2000](#_ENREF_22)) |
| Shigella boydii Sb227 | Shibo\_Sb277 | NC\_007613.1 | ([Yang, et al. 2005](#_ENREF_35)) |
| Shigella dysenteriae Sd197 | Shidy\_Sd197 | NC\_007606.1 | ([Yang, et al. 2005](#_ENREF_35)) |
| Shigella flexneri 2002017 | Shifl\_2002017 | NC\_004741.1 | ([Ye, et al. 2010](#_ENREF_36)) |
| Shigella flexneri 2a str. 2457T | Shifl\_2a\_245T | NC\_004741.1 | ([Wei, et al. 2003](#_ENREF_32)) |
| Shigella flexneri 2a str. 301 | Shifl\_2a\_301 | NC\_004337.2 | ([Jin, et al. 2002](#_ENREF_11)) |
| Shigella flexneri 5 str. 8401 | Shifl\_5\_8401 | NC\_008258.1 | ([Nie, et al. 2006](#_ENREF_20)) |
| Shigella flexneri 5a str. M90T | Shifi\_M90T | CM001474.1 | ([Onodera, et al. 2012](#_ENREF_21)) |
| Shigella sonnei Ss046 | Shiso\_Ss046 | NC\_008258.1 | ([Yang, et al. 2005](#_ENREF_35)) |
| Shigella sonnei 53G | Shiso\_53G | HE616528.1 |  |

aIf no reference is given the genome is a direct submission and the phenotype is taken from the GenBank file annotation

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| **Genome assemblies****All are EAEC/STEC** |
| **Strain** | **ID on trees** | **Accession Number** | **Country of Origin****and referencea** |
| Escherichia coli O104:H4 str. 01-09591 | Escherichia\_coli\_O104\_H4\_01\_09591 | NZ\_AFPS00000000.1 | Germany([Mellmann, et al. 2011](#_ENREF_18)) |
| Escherichia coli O104:H4 str. 04-8351 | Escherichia\_coli\_O104\_H4\_04\_8351 | NZ\_AFRL00000000.1 | France([Grad, et al. 2012](#_ENREF_9)) |
| Escherichia coli O104:H4 str. 09-7901 | Escherichia\_coli\_O104\_H4\_09\_7901 | NZ\_AFRK00000000.1 | France([Grad, et al. 2012](#_ENREF_9)) |
| Escherichia coli O104:H4 str. 11-02030 | Escherichia\_coli\_O104\_H4\_11\_02030 | NZ\_AMVR00000000.1 |  |
| Escherichia coli O104:H4 str. 11-02033-1 | Escherichia\_coli\_O104\_H4\_11\_02033 | NZ\_AMVS00000000.1 |  |
| Escherichia coli O104:H4 str. 11-02092 | Escherichia\_coli\_O104\_H4\_11\_02092 | NZ\_AMVT00000000.1 |  |
| Escherichia coli O104:H4 str. 11-02093 | Escherichia\_coli\_O104\_H4\_11\_02093 | NZ\_AMVU00000000.1 |  |
| Escherichia coli O104:H4 str. 11-02281 | Escherichia\_coli\_O104\_H4\_11\_02281 | NZ\_AMVV00000000.1 |  |
| Escherichia coli O104:H4 str. 11-02318 | Escherichia\_coli\_O104\_H4\_11\_02318 | NZ\_AMVW00000000.1 |  |
| Escherichia coli O104:H4 str. 11-02913 | Escherichia\_coli\_O104\_H4\_11\_02913 | NZ\_AMVX00000000.1 |  |
| Escherichia coli O104:H4 str. 11-03439 | Escherichia\_coli\_O104\_H4\_11\_03439 | NZ\_AMVY00000000.1 |  |
| Escherichia coli O104:H4 str. 11-03943 | Escherichia\_coli\_O104\_H4\_11\_03943 | NZ\_AMWA00000000.1 |  |
| Escherichia coli O104:H4 str. 11-3677 | Escherichia\_coli\_O104\_H4\_11\_3677 | NZ\_AFRM00000000.1 | Germany([Grad, et al. 2012](#_ENREF_9)) |
| Escherichia coli O104:H4 str. 11-04080 | Escherichia\_coli\_O104\_H4\_11\_04080 | NZ\_AMVZ00000000.1 |  |
| Escherichia coli O104:H4 str. 11-4404 | Escherichia\_coli\_O104\_H4\_11\_4404 | NZ\_AFUX00000000.1 | France([Grad, et al. 2012](#_ENREF_9)) |
| Escherichia coli O104:H4 str. 11-4522 | Escherichia\_coli\_O104\_H4\_11\_4522 | NZ\_AFUY00000000.1 | France([Grad, et al. 2012](#_ENREF_9)) |
| Escherichia coli O104:H4 str. 11-4623 | Escherichia\_coli\_O104\_H4\_11\_4623 | NZ\_AFUZ00000000.1 | France([Grad, et al. 2012](#_ENREF_9)) |
| Escherichia coli O104:H4 str. 11-4632 C1 | Escherichia\_coli\_O104\_H4\_11\_4632\_C1 | NZ\_AFVA00000000.1 | France([Grad, et al. 2012](#_ENREF_9)) |
| Escherichia coli O104:H4 str. 11-4632 C2 | Escherichia\_coli\_O104\_H4\_11\_4632\_C2 | NZ\_AFVB00000000.1 | France([Grad, et al. 2012](#_ENREF_9)) |
| Escherichia coli O104:H4 str. 11-4632 C3 | Escherichia\_coli\_O104\_H4\_11\_4632\_C3 | NZ\_AFVC00000000.1 | France([Grad, et al. 2012](#_ENREF_9)) |
| Escherichia coli O104:H4 str. 11-4632 C4 | Escherichia\_coli\_O104\_H4\_11\_4632\_C4 | NZ\_AFVD00000000.1 | France([Grad, et al. 2012](#_ENREF_9)) |
| Escherichia coli O104:H4 str. 11-4632 C5 | Escherichia\_coli\_O104\_H4\_11\_4632\_C5 | NZ\_AFVE00000000.1 | France([Grad, et al. 2012](#_ENREF_9)) |
| Escherichia coli O104:H4 str. C227-11 | Escherichia\_coli\_O104\_H4\_C227\_11 | NZ\_AFST00000000.1 | Denmark/Germany([Rasko, et al. 2011](#_ENREF_23)) |
| Escherichia coli O104:H4 str. C227-11 | Escherichia\_coli\_O104\_H4\_C227\_11B | NZ\_AFRH00000000.1 | Denmark/Germany([Grad, et al. 2012](#_ENREF_9)) |
| Escherichia coli O104:H4 str. C236-11 | Escherichia\_coli\_O104\_H4\_C236\_11 | NZ\_AFRI00000000.1 | Germany([Grad, et al. 2012](#_ENREF_9)) |
| Escherichia coli O104:H4 str. E112/10 | Escherichia\_coli\_O104\_H4\_E112\_10 | NZ\_AHAV00000000. |  |
| Escherichia coli O104:H4 str. Ec11-4984 | Escherichia\_coli\_O104\_H4\_Ec11\_4984 | NZ\_AHOU00000000.1 |  |
| Escherichia coli O104:H4 str. Ec11-4986 | Escherichia\_coli\_O104\_H4\_Ec11\_4986 | NZ\_AHOW00000000.1 |  |
| Escherichia coli O104:H4 str. Ec11-4987 | Escherichia\_coli\_O104\_H4\_Ec11\_4987 | NZ\_AHOX00000000.1 |  |
| Escherichia coli O104:H4 str. Ec11-4988 | Escherichia\_coli\_O104\_H4\_Ec11\_4988 | NZ\_AHOY00000000.1 |  |
| Escherichia coli O104:H4 str. Ec11-5603 | Escherichia\_coli\_O104\_H4\_Ec11\_5603 | NZ\_AHOZ00000000.1 |  |
| Escherichia coli O104:H4 str. Ec11-5604 | Escherichia\_coli\_O104\_H4\_Ec11\_5604 | NZ\_AHOV00000000.1 |  |
| Escherichia coli O104:H4 str. Ec11-6006 | Escherichia\_coli\_O104\_H4\_Ec11\_6006 | NZ\_AHPA00000000.1 |  |
| Escherichia coli O104:H4 str. Ec11-9450 | Escherichia\_coli\_O104\_H4\_Ec11\_9450 | NZ\_AGWF00000000.1 |  |
| Escherichia coli O104:H4 str. Ec11-9941 | Escherichia\_coli\_O104\_H4\_Ec11\_9941 | NZ\_AGWH00000000.1 |  |
| Escherichia coli O104:H4 str. Ec11-9990 | Escherichia\_coli\_O104\_H4\_Ec11\_9990 | NZ\_AGWG00000000.1 |  |
| Escherichia coli O104:H4 str. Ec12-0465 | Escherichia\_coli\_O104\_H4\_Ec12\_0465 | NZ\_AIPQ00000000.1 |  |
| Escherichia coli O104:H4 str. Ec12-0466 | Escherichia\_coli\_O104\_H4\_Ec12\_0466 | NZ\_AIPR00000000.1 |  |
| Escherichia coli O104:H4 str. GOS1 | Escherichia\_coli\_O104\_H4\_GOS1 | NZ\_AFWO00000000.1 | Germany([Brzuszkiewicz, et al. 2011](#_ENREF_5)) |
| Escherichia coli O104:H4 str. GOS2 | Escherichia\_coli\_O104\_H4\_GOS2 | NZ\_AFWP00000000.1 | Germany([Brzuszkiewicz, et al. 2011](#_ENREF_5)) |
| Escherichia coli O104:H4 str. H112180280 | Escherichia\_coli\_O104\_H4\_H112180280 | NZ\_AFPN00000000.2 |  |
| Escherichia coli O104:H4 str. H112180282 | Escherichia\_coli\_O104\_H4\_H112180282 | NZ\_AFSO00000000.1 |  |
| Escherichia coli O104:H4 str. H112180283 | Escherichia\_coli\_O104\_H4\_H112180283 | NZ\_AFWC00000000.1 | United Kingdom |
| Escherichia coli O104:H4 str. LB226692 | Escherichia\_coli\_O104\_H4\_LB226692 | NZ\_AFOB00000000.2 | Germany([Mellmann, et al. 2011](#_ENREF_18)) |
| Escherichia coli O104:H4 str. ON2010 | Escherichia\_coli\_O104\_H4\_ON2010 | NZ\_AHZE00000000.1 | Canada([Hao, et al. 2012](#_ENREF_10)) |
| Escherichia coli O104:H4 str. ON2011 | Escherichia\_coli\_O104\_H4\_ON2011 | NZ\_AHZF00000000.1 | Canada([Hao, et al. 2012](#_ENREF_10)) |
| Escherichia coli O104:H4 str. TY-2482 | Escherichia\_coli\_O104\_H4\_TY\_2482 | NZ\_AFVR00000000.1 |  |

aIf no reference is given the genome is a direct submission and the country of origin is not specified or is taken from the GenBank file.

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