**Supporting information**

Supplementary table 1

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| **Table S1** Strains and cultivation condition used in this study | | | | | | | |
| **ID** | **Strain** | **Gram-stain** | **Genome size (Mbp)** | **plasmid (kbp)** | **Atmosphere a** | **Mediumb** | **Reference** |
| ***Bacteria strains*** | | | | | | | |
| 1 | *Lactobacillus plantarum* | + | 3.20 | 0 | Anaerobic | MRS:Agar and broth | [55] |
| 2 | *Lactobacillus fermentum* | + | 1.90 | 32.6 | Anaerobic | MRS:Agar and broth | [56] |
| 3 | *Staphylococcus aureus* | + | 2.80 | 0 | Aerobic | LB: Agar and broth | [57] |
| 6 | *Bordetella bronchiseptica* | - | 5.20 | 0 | Aerobic | LB: Agar and broth | [58] |
| 7 | *Citrobacter freundii* | - | 4.96 | 0 | Aerobic | LB: Agar and broth | [59] |
| 8 | *Bacillus cereus* | + | 5.50 | 208 | Aerobic | LB: Agar and broth | [60] |
| 9 | *Staphylococcus hominis* | + | 2.34 | 0 | Aerobic | LB: Agar and broth | [61] |
| 10 | *Salmonella typhimurium* | - | 5.10 | 265 | Aerobic | LB: Agar and broth | [62] |
| 11 | *Providencia stuartii* | - | 4.42 | 0 | Aerobic | LB: Agar and broth | [63] |
| 12 | *Staphylococcus epidermis* | + | 2.45 | 15.14 | Aerobic | LB: Agar and broth | [64] |
| 13 | *Micrococcus sp. KBS0714* | + | 2.42 | 0 | Aerobic | LB: Agar and broth | [65] |
| 14 | *Staphylococcus aureus* ATCC 6538 | + | 2.82 | 28 | Aerobic | LB: Agar and broth | [66] |
| 15 | *Enterobacter cloacae* | - | 4.78 | 208.74 | Aerobic | LB: Agar and broth | [67] |
| 16 | *Escherichia coli ATCC 8739* | - | 5.40 | 0 | Aerobic | LB: Agar and broth | [68] |
| 17 | *Staphylococcus haemolyticus* | + | 2.63 | 41.6 | Aerobic | LB: Agar and broth | [69] |
| 18 | *Morganella morganii* | - | 3.86 | 0 | Aerobic | LB: Agar and broth | [70] |
| 19 | *Proteus mirabilis* | - | 4.01 | 102 | Aerobic | LB: Agar and broth | [71] |
| 20 | *Klebsiella pneumoniae* | - | 5.59 | 180 | Aerobic | LB: Agar and broth | [72] |
| 21 | *Serratia marcescens RSC-14* | - | 5.12 | 0 | Aerobic | LB: Agar and broth | [73] |
| ***Yeast strains*** | | | | | | | |
| 22 | *Naganishia sp (HMI)* | NA | Unknown | NA | Aerobic | PDA | In preparation |
| 23 | *Candida albicans* | NA | 14.69 | NA | Aerobic | PDA | [74] |
| 24 | *Candida tropicalis* | NA | 15.3 | NA | Aerobic | PDA | [59] |
| 25 | *Rhodotorula* | NA | 18.6 | NA | Aerobic | PDA | [75] |
| aAnaerobic strains were cultivated in GasPak anaerobic chamber (Becton Dickinson, Franklin Lakes, NJ) with Pack-Anaero sachet (MGC Inc., New York, NY). | | | | | | | |
| bMedium: LB, Luria-Bertani (LB agar: 10 g NaCl, 10 g tryptone, 5 g yeast extract per liter, pH 7.2. Add 1.5% agar. Sterilize by autoclaving.); MRS, De Man, Rogosa and Sharpe (Oxoid, Basingstoke, UK); PDA, potato dextrose agar. | | | | | | | |
|
| HMI, Human milk isolated; NA, not apply; | | | | | | | |

Supplementary table 2

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| **Table S2** Summary of DNA extraction methods used in this study | | | | | | | | |
| **Method name** | **Code** | **Basis and format** | **Starting material** | **Cell lysis** | **Removal of contaminants** | **DNA precipitation** | **Elution buffer** | **Reference** |
| Quick-DNA™ Fecal/Soil Microbe Kit | ZYMO | Solid-based; Silica based and ZymoSpin™ Technology | Cell pellet from 5 mL of mature human milk | ZR BashingBead™ in a Lysis solution | Silica matrix | ZymoSpin™ Technology | 20 µL DNA Elution Buffer | (Zymo Research, Tustin, CA, USA) |
| Guanidinium thiocyanate | GTA | Solution-based; Guanidinium thiocyanate | Cell pellet from 5 mL of mature human milk | Bead-Beating method with a lysis buffer (4M guanidine thiocyanate, Tris 0.1M, pH 7.5 y 600 µL of N-Lauroylsarcosine) | TENP (Tris 50 Mm, pH i, EDTA 20 Mm, pH 8; NaCl 100 Mm, 1% polyvinylpyrrolidone) | 1/10th volume of sodium acetate from 3M pH5.2 and 2.5-3 vols ice cold 100% Ethanol | 40 µL sterile deionized water | Modify from (Alarcón-Zúñiga et al., 2016) |
| Hexadecyltrimethylamonium bromide double phenol step | CTAB-2PH | Solution‑based; selective precipitation of DNA with CTAB (10%). | Cell pellet from 5 mL of mature human milk | Chemical and enzymatic lysis with SDS 10% and lisozyme (100 mg/mL) | Washing with organic solvents, two strong (phenol:chloroform:Isoamyl alcohol), and one weak (chloroform:isoamyl alcohol) | Ice cold 0.6 volume of isopropanol | 40 µL sterile deionized water | Modify from (William et al., 2004) |
| Hexadecyltrimethylamonium bromide standardized for human milk | CTAB-CTD | Solution‑based; selective precipitation of DNA with CTAB (10%). | Cell pellet from 5 mL of mature human milk | Mechanical lysis using liquid nitrogen (N2 +). Chemical lysis with SDS 10% coupled with lisozyme (100 mg/mL) | Washing with organic solvents,one strong (phenol:chloroform:Isoamyl alcohol), and two weak (chloroform:isoamyl alcohol) | Ice cold Isopropanol (v/v) | 40 µL TE buffer (10 mM Tris hydrochloride, 1 mM EDTA, pH 8.0) | This study |
| mg, miligrams; Ml, mililiters; mM, miliMolar, v/v, volumen/volumen; µL, microliters; | | | | | | | | |
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Supplementary table 3

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| **Table S3** DNA Quality based on electrophoresis of genomic DNA | | | | |
| Electrophoretic characteristics |  | Electrophoretic Integrity | Indicator description | Assigned score |
| DNA quality must be assessed in 1% agarose gel |  | High integrity | Well defined line at the top of the gel (Discrete band) | 3 |
|  | Adequate integrity | Simultaneous presence of a partially discrete band at the top with slight smearing | 2 |
|  | Partially degraded | No discrete band and the presence of a concentrated smear at the top and along the entire electrophoretic run. | 1 |
|  | Fully degraded | No band, smear is concentrated at the bottom or not observed | 0 |
| Adapted from "Programa de control de calidad de ácidos nucleicos. Carlos III National DNA Bank (University of Salamanca). www.bancoadn.org" | | | | |