**Table S1.** Selected electrochemical (bio)sensors for biomarkers of human microbiomes and related biomolecules applied to clinical samples.

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| **Microbiome** | **Biomarker** | **(Bio)sensor configuration** | **Technique** | **Analytical characteristics** | **Sample** | **Ref.** |
| **Intestinal** | TMAO | PPy-MIP/ITO | DPV | DR: 1−15 μg mL-1; LOD: 1 μg mL-1 | urine | 23  |
|  | TMAO | enzyme TorA-FDH/MV/GCE | amperometry | DR: 2−110 μM; LOD: 2.96 nM | serum | 24 |
|  | TMAO | enzyme TorA-GOD /Cat/MV/GCE | amperometry | DR: 2 μM−15 mM; LOD: 10 μM (serum) | 10% serum | 25  |
|  | TMAO | S. loihica PV-4/CCE | amperometry | DR: up to 250 μM; LOD: 5.96 μM | serum | 26 |
|  | SCFAs | ZnO/PVA/AuE | EIS | DR: 0.5−20 mg mL-1 | bacterial isolates | 33 |
|  | IL-10 | microfluidic immunosensor: anti-IL-10 immobilized onto PCA/Gr-foam  | EIS | DR: 10−100 fg mL-1; LOD: 7.89 fg mL-1 | artificial saliva | 48 |
|  | IL-1βCRP | multiplexed wearable immunosensor: immobilization of anti-IL-1β and anti-CRP onto DTSSP-modified SPEs  | EIS | DR: 0.2−200 pg mL-1 IL-1βDR: 0.2 pg mL-1−10 ng mL-1 CRP  | spiked and on-body sweat | 50 |
|  | CRP | Label-free immunosensor: anti-CRP-L-Cyst-AuNPs/SPE | amperometry | DR: 0.4–200 nMLOD: 0.15 nM | serum | 51 |
|  | CRP | Sandwich-type immunosensor: IrNPs/GO-DN-dAb-CRP-cAb-AuNPs/IL-MoS2 | amperometry | DR: 0.01−100 ng mL-1LOD: 3.3 pg mL-1 | serum | 52 |
|  | MPO | Microfluidic device. cAb-biotin-Strep-MBs | amperometry | LOD: 0.004 ng mL-1 | plasma | 57 |
|  | MPO | cAb-CuPdPt/GCE | amperometry | DR: 100 fg mL-1−50 ng mL-1; LOD: 33 fg mL-1 | serum | 58 |
|  | MPO | Immunoassay: cAb adsorbed onto PS dipstick. Detection at N-CNTs/GCE | amperometry | DR: up to 700 μg mL-1; LOD: 70 μg mL-1 | saliva | 59 |
|  | ALP | Label-free immunosensor: anti-ALP/GO/Au-nano-dendroids/AuNPs/SPCE | EIS | DR: 100−1000 U L-1; LOD: 9.1 U L-1 | serum | 64 |
|  | ALP | DNA biosensor: AFC/ALP /MCH/ssDNA/AuE | DPV | DR: 20−100 mU mL-1; LOD: 1.48 mU mL-1 | serum | 65 |
|  | Indole | MWCNTs/CS/SPCE | DPV | DR: 5−100 μg L-1; LOD: 0.5 μg L-1 | plasma | 68 |
|  | 5-HIAA | MIPPy/GCE | DPV | DR: 5×10-11−5×10-5 M; LOD: 5×10-12 M | serum, urine, plasma | 69 |
|  | iFABP | Label-free sandwich-type immunosensor: AuNPs-dAb-iFABP-cAb-interdigitated AuE | EIS | DR: up to 7 ng mL-1; LOD: 0.68 ng mL-1 | urine | 70 |
|  | CALP | Non-enzyme sandwich-like immunosensor: cAb-pDA /Au@MWCNTs/GCE. Detection with dAb-(PtNi@TCPP(Fe)) | amperometry | DR: 200 fg mL-1−50 ng mL-1LOD: 137.7 fg mL-1 | serum | 72 |
| **Oral** | MMP-9 | Sandwich-type immunosensor: poly-HRP-bdAb-MMP-9-cAb-MBs/SPCE | amperometry(TMB) | DR: 0.03−2 ng mL-1LOD: 13 pg mL-1 | plasma | 92  |
|  | MMP-9 | Sandwich-type immunosensor: HRP-bdAb-MMP-9-cAb-MBs/SPCE | amperometry | DR: 8.0−75 pg mL-1; 75−10000 pg mL-1LOD: 2.4 pg mL-1 | cell lysates serum | 93 |
|  | IL-8 | Sandwich-type immunosensor: DI-3-b-Neu-bdAb-IL8-cAb-silane copolymer-ITO | Chronocoul.NADH/ Os(bpy)2Cl2 | DR: 1 pg mL-1−1 μg mL-1 LOD: ~1 pg mL-1 | saliva | 99 |
|  | IL-8 | Label free immunosensor: IL-8-anti-IL-8-β-Ag2MoO4NPs/ITO | DPV | DR: 1 fg mL−1−40 ng mL−1LOD: 90 pg mL−1 | saliva | 100 |
|  | IL-8 | anti-IL-8-AuNPs/rGO | DPV | DR: 500 fg mL−1−4 ng mL−1LOD: 72.73 pg mL-1 | saliva | 101 |
|  | IL-8 | anti-IL-8-CB/PVDF/SPGMA/ITO | EIS | DR: 0.01−3 pg mL-1 ; LOD: 3.3 fg mL-1 | saliva, serum | 102 |
|  | IL-8 | Label-free immunosensor: anti-IL-8-PHA/ITO | EIS | DR: 0.02−3 pg mL-1; LOD: 6 fg mL-1 | serum, saliva | 103 |
|  | IL-8 | Label-free immunosensor:anti-IL-8-IPTES/FTO | EIS | DR: 0.02–4 pg mL-1; LOD: 11.9 fg mL-1 | serum, saliva | 104 |
|  | IL-1β | Label-free immunosensor: anti-IL-1β-PHA/ITO | EIS | DR: 0.025–3 pg mL-1; LOD: 7.5 fg mL-1 | serum, saliva | 106 |
|  | IL-1β | Sandwich-type immunosensor: AP-strep-bdAb-IL-1β-cAb-IgG-ethynyl-azide-MWCNTs | DPV(1-NPP) | DR: 10−200 pg mL-1 ; 200−1200 pg mL-1LOD: 5.2 pg mL-1 | saliva | 107 |
|  | IL-8IL-8 mRNA | HRP-strep-IL-8 mRNA-b-HCpIL-8-MBs/  and HRP-strep-bdAb-IL-8-cAb-MBs/SPdCE | amperometry | DR: 0.32−7.5 nM IL-8; DR: 87.9−5,000 pg mL-1IL-8 mRNALOD: 72.4 pg mL-1 IL-8; 0.21 nM IL-8 mRNA  | saliva | 108 |
|  | IL-1βTNF-α | Dual immunosensor: poly-HRP-bcAb- IL1β- dAb- and poly-HRP-bcAb-TNFα -dAb-phe-DWCNTs/SPdCE | amperometry | DR:0.5−100 pg mL-1 IL-1β;1−200 pg mL-1 TNF-α, LOD: 0.38 pg mL-1 IL-1β; 0.85 pg mL-1 TNF-α | serum, saliva | 109 |
|  | anti-CCP | Label-free immunosensor: PANI/AuNPs/anti-CCP-CCP/ PANI/MoS2/SPCE | SWV | DR: 0.25−1500 IU mL-1LOD: 0.16 IU mL-1 | 10% serum | 113 |
|  | RFanti-CCP | Dual immunosensor: HRP- IgM-RF-Fc(IgG)-cMBs/ and HRP-IgG-anti.CCP-CCP-biotin-Neutr-MBs/SPdCE | amperometry | DR: 3−300 IU mL−1 RF; 10−1000 IU mL−1anti-CCPLOD: 0.8 IU mL-1 RF; 2.5 IU mL-1anti-CCP | serum | 113 |
| **Nasal** | IL-8 | Label-free immunosensor: cAb-CBMA/AuE | EIS | DR: 55 fM−55 nM; LOD: 1 fM | NELF | 116 |
|  | IL-6 | Non-enzyme sandwich-type immunosensor: NB-GO-dAb-IL-6-cAb-GO/AuE | SWV | DR: 1−300 pg mL-1; LOD: 1 pg mL-1 | RAW cells;live mice brain | 123 |
|  | VEGFIFN-γTNF-α | Multiplexed aptasensor: biotin-VEGF-apt-AQ-, biotin-IFN-γ-apt-MBT and biotin-TNF-α-apt-Fc-Strep/GO/AuE | SWV | DR: 5−300 pg mL-1(VEGF, IFN-γ); 5−200 pg mL-1 (TNF-α); LOD: 5 pg mL-1 | serum, sweat | 124 |
|  | VEGF | Ratiometric aptasensors: Fc-apt-biotin-strep -MB/GO-ph-GCE or -MB/GO/GCE | SWV(IMB/IFc) | DR: 20−500 pg mL-1; LOD: 7 pg mL-1DR: 10−500 pg mL-1; LOD: 1 pfg mL-1 | serum | 125  |
|  | EGFRVEGF | Sandwich immunosensors: LP@Cd(II)-anti-EGFR- and LP@Cu(II)-anti-VEGF-MIP-DSP-SPAuE | PSA | DR: 0.05–50000 pg mL-1; LOD: 0.01 pg mL-1DR: 0.01–7000 pg mL-1; LOD: 0.005 pg mL-1 | serum | 126  |

**Keywords:** AFC, aminoferrocene; ALP, alkaline phosphatase; Cat, catalase; CB, carbon black; CCE, carbon cloth electrode; CCP. cyclic citrulinated protein; CS, chitosan; DN, 1,5-diaminonaphthalene; DPV, differential pulse voltammetry; DR, dynamic range; DSP, 3,3′-dithiodipropionic acid di(N-hydroxysuccinimide ester; EGFR, epidermal growth factor receptor; EIS, electrochemical impedance spectroscopy; Fc, ferrocene; FDH, formate dehydrogenase; iFABP, intestinal fatty-acid binding protein; IFN-γ, interferon gamma; IL, 1-aminopropyl-3-methylimidazolium chloride; IPTES, 3-(triethoxysilyl) propyl isocyanate; ITO, indium-tin oxide electrode;LOD, detection limit; LP, liposome; MB: methylene blue; MCH, 6-mercapto-1-hexanol; MIP, molecularly imprinted polymer; MIPPy, molecularly imprinted polypyrrole; MV, methyl viologen; NB, Nile blue; N-CNTs, nitrogen-doped carbon nanotubes; pDA, poly(dopamine); PPy, poly(pyrrole); PS, polystyrene; PSA, potentiometric stripping analysis; PVA, poly(vinylalcohol); PVDF, polyvinylidene fluoride; RF, rheumatoid factor; rGO, reduced graphene oxide; *S.* Ioihica, *Shewanella loihica*; SCFAs, short-chain fatty acids; SPGMA, shaped poly(glycicylmethacrylate); TCPP, tetrakis (4-carboxyphenyl) porphyrin; TMAO, trimethylamine N-oxide; TNF-α, tumor necrosis factor-α; TorA, trimethylamine N-oxide reductase; VEGF, vascular endothelial growth factor.