Supplementary information

Table S1

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| --- | --- | --- | --- | --- | --- | --- |
| Isolation technique | Recovery rate | Specificity | Advantages | Disadvantages | Merchants | Reference |
| Density gradient centrifugation | Low | High | 1.High properties and purity of products ;  2.Allowing separation of subpopulation of exosomes | 1.Cumbersome preliminary work, complicated opera-  tion, time-consuming;  2.Treatment capacity is limited by the load zone;  3.Hard to remove high-density chemi-  Cals;  4.subcellular water loss caused by hypertonic  reagents;  5.Not suitable for small volume diagnosis  6.Low portability | Sigma Aldrich | (Jeppesen et al., 2014) |
| Sequential ultracentrifugation | High | Low | 1.Simplified operation;  2.Simplified sample pretreatment  3. Low contamination risk with extra isolation reagents; 4.Suitable for large volume preparation | 1.Low RNA yield and mix with other kind of EVs like impurity proteins;  2. Potential mechanical damage due to high speed centrifugation | Abcam | (Doyle & Wang, 2019) |
| Size-exclusion chromatography | Middle | Middle | 1.High purity and sensitivity;  2.Not affected by  the high viscosity of the sample;  3.Prevents exosomes aggregation;  4.Easy to distinguish from high-density lipopro-  tein | 1.Relatively high device costs ;  2.Additional method for exosome enrichment is required | Sigma Aldrich | (Gámez-Valero et al., 2016; Konoshenko et al., 2018) |
| Immunoaffinity capture | Low | High | 1.Easy to use ;  2.Using ordinary equipment ;  3.Suitable for both small and large sample volume;  4.High efficiency | 1.Contaminants of protein aggregates, other extracellular vesicles and polymeric contaminants ;  2. Require complicated clean-up steps;  3.Affecting downstream analysis and quantification | Thermofisher;  Yesen | (Liu & Su, 2019) |
| Microfluidic-based isolation technique | Low | High | 1.Easy to automate and integrate;  2.High portability and purity ang low reagents;  3.Exosomes extrac-  tion and analysis can be combined | Low sample capacity | LabSpinner;  System Biosciences | (Momen-Heravi et al., 2012) |
| Ultrafiltration | Middle | Middle | 1. Fast procedure;  2.Low equipment cost | 1.Hard to remove soluble proteins;  2.Poor sustainability,  3.The external force may damage biological activity of  exosome[ | Cytiva pall | (Cheruvanky et al., 2007) |
| Polymer Precipitation | Low | High | 1.Using ordinary equipment  2.Suitable for both small and large sample volume  3.High efficiency | 1.Affecting downstream analysis and quantification;  2.Require complicated clean-up steps | Biosharp | (Soares Martins et al., 2018) |

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