

## Specification for Protein Purification System

1. System should be able to have a flow rate of 25ml and an upgrade possibility to reach more than 125ml
2. System should be able to form a quaternary gradient
3. Should be able to perform a reverse flow
4. There should be pre and post column pressure sensors, and means for delta pressure (pressure exerted on column bed) measurement and automatic identification of mixers and UV flow cell
5. There should be an automatic pressure flow control mode
6. There should be at least 7 sample and buffer inlet valves, along with column connections to 5 separate columns
7. The operating software should have a library of standard purification programs which are compatible to Windows 10 operating system
8. System/Software should have a Design of Experiment
9. System should have an automatic buffer preparation
10. System should have a *Column Logbook and UniTags*
11. System should have a *Method Editor*
12. System should provide real-time measurement of absorbance over UV and visible range of 190 to 700nm. To visualize protein separation at different wavelengths, the UV monitor should have a flip-mode that allows monitoring of up to three wavelengths simultaneously with a Xenon flash lamp with fiber optics for high sensitivity and long lamp life minimizing dead volume.
13. System should continuously measure pH of buffer and samples.

14. The fraction collector should have a temperature control to prevent sample overheating and prevents dust from being introduced into purified samples. Different cassette provisions should be available for tubes (3, 8, 15, and 50 ml) as well as deep well plates (24-, 48-, and 96-well). Six cassettes should be loaded into the fraction collector in any combination.
15. System should have a Accumulator function which temporarily holds the liquid flow during the time it takes to move to the next tube or well.
16. System should have an Integrated air sensors are placed in the sample inlet valve and inlet valves A and B. When air is detected, the system is paused so that the air can be removed before further introduction into the flow path