Bioseparation using reversible precipitation of cleavable beta roll peptide tags

Scientists must often separate one biomolecule from a complex mixture of several others – a task known as bioseparation. There are currently a number of approaches, including chromatography, but they typically require specialized treatments or are otherwise expensive and time consuming. This technology uses cleavable beta roll peptide tags that reversibly precipitate in the presence of calcium to enable efficient bioseparation of proteins and other biomolecules from cells, in vitro systems, and other complex mixtures. It has potential applications across the fields of biology, biochemistry, and bioengineering.

Rapid, high-yield purification of biomolecules without chromatography

This technology uses a cleavable beta roll peptide tag to enable high-yield biomolecular separation without chromatography or thermal cycling. The tag is fused to the biomolecule of interest, which can then be selectively precipitated out of a calcium-containing buffer. Upon transfer to calcium-free buffer, the precipitate redissolves. The beta roll tag is then cleaved and precipitated back out of solution, leaving behind a pure, untagged sample of the desired biomolecule. This purification procedure reduces costs, time for separation, and represents a more readily scalable technology than conventional techniques.

This technology has successfully purified maltose binding protein (MBP), MBP-fusions to green fluorescent protein (GFP), b-lactamase, and thermostable alcohol dehydrogenase (AdhD) from E. coli.

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Applications:

- Expression of proteins with beta roll tags
- Purification of exogenous proteins from E. Coli, yeast, or other organisms
- Purification of biomolecules from in vitro systems
- Biomolecular sensing and diagnostics
• Concentration of proteins from solution
• Induced protein folding and stabilization

**Advantages:**

• Rapid, scalable, high-yield
• Does not require thermocycling
• Does not require chromatography
• Cleavable tag is readily isolated from the target biomolecule

**Patent Information:**

Patent Pending (US 20140187746)

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**Related Publications:**


**Inventors**

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