

Elevator Pitch for Impact Proteomics

Our company, Impact Proteomics, makes protein sample preparation kits to provide researchers in the pharmaceutical and biotechnology industries with high quality protein samples faster than ever, improving research reproducibility and saving time and money. High quality protein preparations are essential for drug and biomarker discovery, monitoring therapeutic efficacy, biologic drug quality control, and for understanding fundamental cellular processes. For decades, industry and academia have been hindered by incomplete and irreproducible protein sample preparation. These samples are often contaminated with other cellular components and incompatible reagents, such as DNA, salts, and the reagents used to break open cells. Fast, high quality sample preparation can mean the difference between finding a lifesaving drug target or wasting millions of dollars and decades of time on a failed drug discovery project.

The field of proteomics, the study of all proteins in cells or tissues, is at a similar juncture as molecular biology was in the 1980s. Lack of sample preparation standardization meant DNA samples were inconsistent and often contaminated with other cellular components. Today, companies like Qiagen have revolutionized the fields of molecular biology and genomics by standardizing DNA sample preparation. Our goal is for Impact Proteomics to be the standard for protein sample preparation, transforming the field of proteomics into a powerhouse on the same level as genomics and transcriptomics. The growing efforts in genomics and personalized medicine have driven growth in the proteomics markets, because while your DNA can reveal a lot, without proteins they paint an incomplete picture. This provides substantial commercial opportunity, with an initial addressable market of \$1 billion within the \$7 billion of the proteomics sample preparation market. Additionally, these sample preparation tools can be used to develop powerful diagnostics and personalized medicine in the field of autoimmune disorders, which comprises more than 70 autoimmune diseases and 13.5 million patients without diagnostics and only limited therapeutic options, addressing another \$50 billion industry. Our tools greatly reduce hands-on sample preparation time and provide samples of higher quality and content—and is also amenable to automation for high throughput, patient specific analysis. This reduces variability and provides more information, allowing scientists to complete their projects more efficiently and reliably, as well as discover potential drug targets or biomarkers that would have been missed using other sample preparation methods, saving time and money on each research project.

Our technological innovation lies in the ability to reversibly place a specific chemical tag on any protein-based molecules, including single proteins, whole proteomes, or peptide mixtures (fragmented proteins used for mass spectrometry). This chemical tag does not react with other cellular components, such as DNA and RNA, or the reagents used to break open cells that interfere with proteomic analytical methods. In addition to coupling to proteins, the tag was also designed to rapidly and irreversibly couple to micron- sized beads, allowing for immobilization of tagged proteins on the bead surface. This allows the user to wash away all non-protein compounds in the initial sample, leaving pure protein bound to the beads. Because the bond between the tag and the protein is reversible under very specific conditions, one can release the purified proteins into solution, separating them from the beads and the tag. This entire process is done within a single tube in just a few hours and can easily be incorporated into any proteomics workflow. Additionally, because our technology does not rely on filters or precipitation like other technologies, it enables us to concurrently purify other important biological molecules such as DNA, RNA, or metabolites to provide additional information about a biological sample. The protein sample preparation tools developed by Impact Proteomics will transform proteomics, biomarker discovery and drug development by accelerating research productivity, getting meaningful drugs, therapies, and diagnostic tools to market faster and with a deeper understanding of the mechanisms underlying their mode of action.