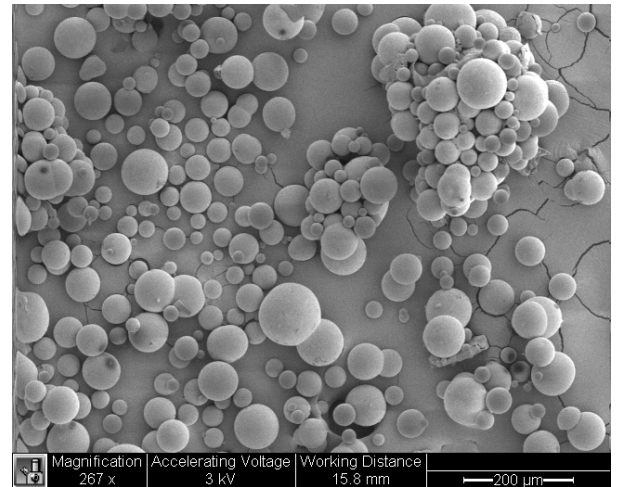


Originally discovered at Duke University in the laboratory of David Needham, Microglassification™ is a room-temperature drying process that involves removing excess water and water of hydration from a protein solution to form solid microbeads of amorphous protein (Fig 1). We have established the feasibility of this cost effective process and, upon rehydration, observed minimal protein loss due to irreversible aggregation. Furthermore, the proteins with measurable enzymatic activity (e.g. catalase) displayed no loss in function following Microglassification™. The process allows control of particle size, water content, and temperature during dehydration, and is completed quickly (minutes). These features offer significant advantages over the existing systems such as lyophilization (freeze drying). We are actively pursuing partnerships to build industrial exposure and



**Fig. 1.** SEM image of Microglassified™ albumin microspheres. (bar = 200 µm)

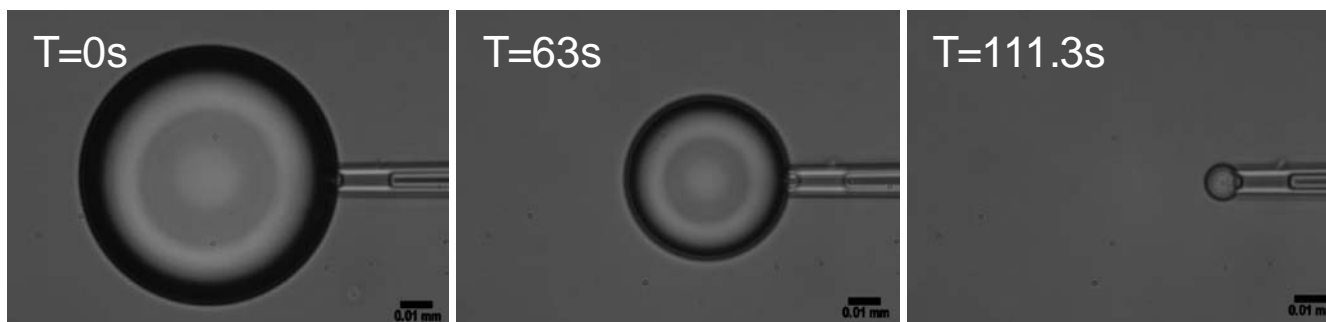
## Microglassification™ Advantages

- Relatively fast drying process
- Control of particle size
- Control of water content
- Does not damage expensive protein and peptide therapeutics
- Cost effective procedure
- No specialized equipment

interest. STI has previously identified biopharmaceuticals as the target market for commercialization through licensing of Microglassification™ to enhance protein preservation. Preliminary development funding has already included over \$700,000 in SBIR grants from NSF and NIH.

As shown in Fig 2, using our signature micropipet manipulation platform, single particle studies (picoliter scale) provide valuable insight into process parameters such as drying time, hydration level, and final protein concentrations, --essential for

establishing conditions for scale up (microliter and greater scale). This technology is now ready for development in specific applications, such as protein and peptide drug delivery.



**Fig. 2.** Digital optical microscope images capturing the Microglassification™ process for 70 micron diameter microdroplet of albumin solution to a single 10µm microglassified bead (bar = 0.01 mm)