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A reliable method for sample loading during metabolic monitoring under high pressure MILLICENT GIKUNDA, PAUL URAYAMA, Miami University — In previous publications, we presented a system for monitoring cellular metabolism under pressure, designed around a simple-to-construct, capillary-based spectroscopic/imaging chamber coupled to a microliter-flow perfusion system. The millimeter-sized capillary chamber functions up to 100 MPa, spanning most of the biosphere's pressure range. The perfusion system consists of two screw pump generators with one generator being compressed while the other is retracted, maintaining pressurization during flow. Although metabolic transitions can be controllably induced and monitored using the system (validated under pressure by monitoring the cyanide-induced response of UV-excited autofluorescence from *Saccharomyces cerevisiae*), the previous sample-loading protocol was not well controlled. Here, we present a reliable approach for loading cellular samples, using a secondary capillary into which the sample is loaded, which is then inserted into the chamber. As validation, we demonstrate the ability to measure fluorescence from labeled microspheres, and to observe the cyanide-induced autofluorescence response in *S. cerevisiae*. This study contributes to the development of monitoring approaches for studies involving the interaction between the physical environment with cellular metabolism.

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