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## Research Seminar

When: April 7, 2022

Time: 12:00 p.m.

Location: CBL-16

## **BioCaRGOS: A compatible silica matrix for storage and efficient release of proteins and nucleic acids**

### **Abstract**

Proteins and nucleic acids that are sensitive to denaturation with loss of secondary and tertiary structures when they are not stored in the right environment. Techniques such as cryo storage or refrigeration-based storage, and lyophilization techniques have been the state of art technologies used to achieve stabilization of biospecimens.<sup>1</sup> However, these techniques are associated with certain limitations such as frequent freeze thaw cycles, they are cost prohibitive, and are associated multiple hydration, and rehydration cycles. Herein, we have engineered capture and release gels for optimized biospecimen storage (BioCaRGOS) by hydrolysis of TMOS using standard microwave which has shown long term storage of proteins and nucleic acids at ambient temperatures.<sup>2-5</sup> Though there are several encapsulation techniques for biospecimens, two main challenges currently faced are compatibility with bioassays and development of biocompatible release protocol. In our work, we have addressed these key issues of compatibility by removing methanol from BioCaRGOS prior to addition of biospecimens and release of biospecimens after storage in BioCaRGOS. Moreover, we have investigated the compatibility with plasma extractions and with different downstream analytical techniques such as ddPCR and ELSIA<sup>6-7</sup>. We have further demonstrated BioCaRGOS which acts as a protease inhibitor and maintains the integrity of proteins in presence of proteases thereby making it an excellent candidate for storing cancer biomarkers in complex systems such as plasma. Thus, the clinical applications of CaRGOS are vast when compared to its predecessors and present a feasible alternative to conventional cryopreservation platforms.

### **References**

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