

## **Bioresorbable phosphate glass microstructured optical fibers with hole and core for biomedicine (Poster)**

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### **Abstract**

Over the last decades, there has been a growing interest towards optical fiber technology for biomedical field. Several applications that require insertion of optical fibers into the human body will take advantage of the availability of bioresorbable fibers able to be gradually resorbed by the tissue eliminating the need for follow-up explant surgery. Calcium-phosphate glasses have been designed and synthesized in our laboratory to be dissolvable in biological fluids while showing a wide range of transparency, mechanical reliability, and suitability for both preform extrusion and fiber drawing. Step index single-mode and multi-mode optical fibers have been drawn from these glasses using a custom-made induction heated drawing tower. In this work we report the fabrication of a microstructured bioresorbable optical fiber featuring a multi-mode core and a microfluidic channel. The preform was drawn to 130 and 230  $\mu\text{m}$  diameter fibers. Light guide and attenuation loss were characterized, and the microfluidic channel was tested for liquid delivery. The proposed fiber shows a vast potentiality in theragnostic applications where the ability of delivery liquid and light simultaneously could enable novel devices to be employed in specific areas inside the body without needing a removal procedure.