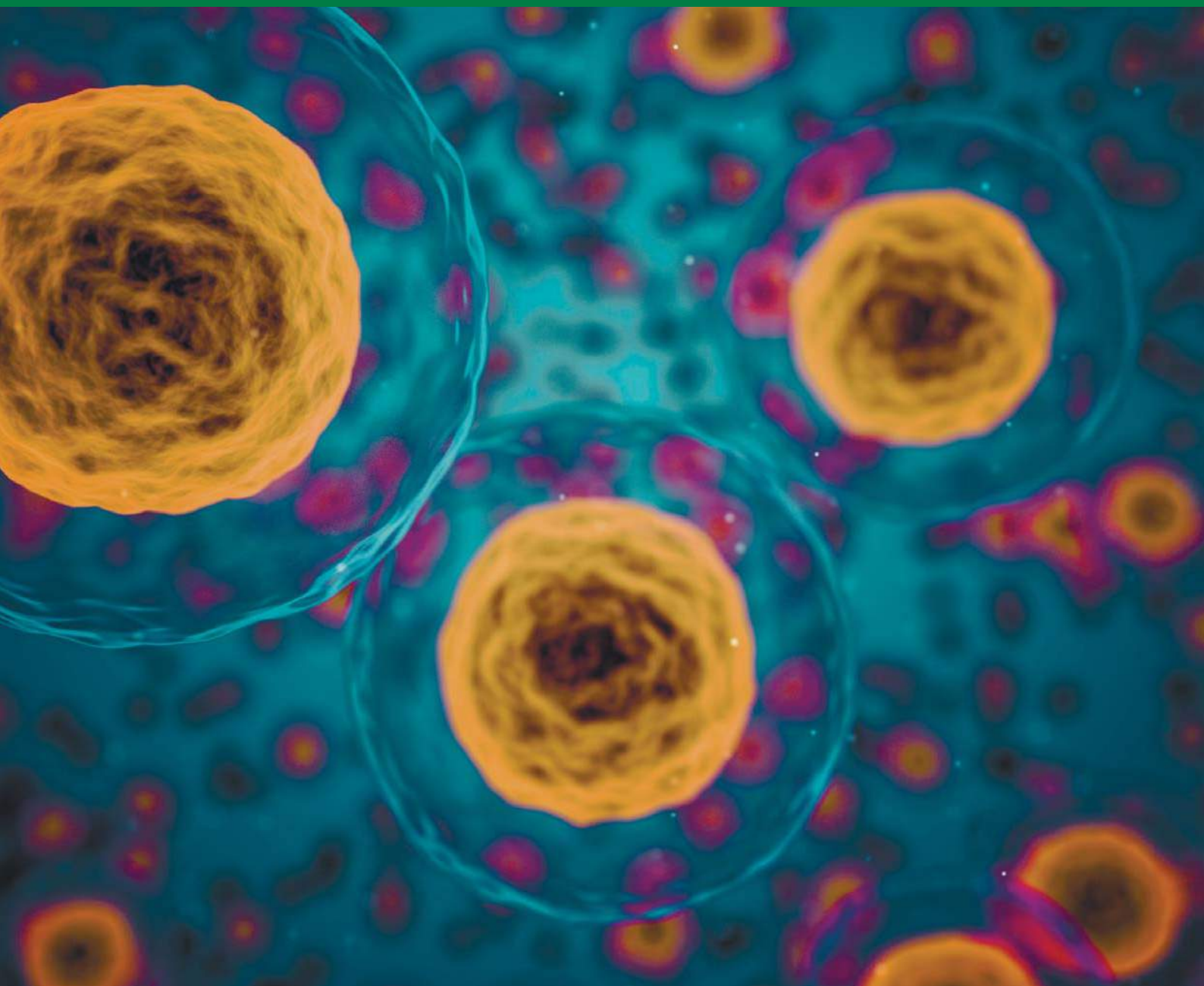


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THE HOT PRESSING OF THE ZIRCONIUM OXIDE CERAMIC FOR BIOENGINEERING PURPOSE

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Oxide ceramics have become widely used materials in various fields of technologies, particularly in bioengineering. Due to such advantages as wear resistance, high density and hardness, it have been successfully introduced in dentistry and orthopedics.

Zirconium oxide and alumina oxide ceramics are wide spread systems in biomedicine field because of its bioinert properties. Being characterized by high fracture toughness and strength, zirconium oxide ceramics are frequently used as a material for biological implants, dental structures, prostheses, and etc. Because of such characteristics, as chemical stability, biocompatibility and durability, zirconium oxide ceramics were used in orthopedics as an alternative system to metal tools. In addition to having high mechanical characteristics, an excellent color- stability allowed to apply it as oral implants and esthetic restorations. Resent researches reported that the hydrothermal stability in one of the disadvantage of the orthopedic implants. Either fracture toughness and the hydrothermal stability have been increased by the co- stabilization of zirconia dioxide system by 1mol% Y_2O_3+1 , 2% Nd_2O_3 and CeO_2 due to stabilization of the t-phase of the zirconium oxide composite.

Mechanical properties of zirconium oxide ceramics directly dependent on the methods of manufacturing of powders and sintering process. Moreover, mixing of initial powders indicates homogeneity of the properties of the obtained ceramics.

Electroconsolidation is the method of sintering of ceramics based on appliance of conventional alternating current of industrial frequency, without additional equipment with special pulse generators. The ability to change currents in a wide range and the possibility of adjusting the parameters during the sintering process of the zirconium oxide ceramics allows real-time control and changing the sintering speed, which in turn make it possible to entire hot pressing process to be carried out within 15-20 minutes. The sintening of ceramics by this method without growing of grains of initial powders



indicates electroconsolidation as a preferable method of manufacturing of zirconium oxide ceramics.

Recently, the electroconsolidation method has been successfully used in order to obtain zirconium oxide ceramics from ZrO₂-Y₂O₃ nanopowders.

The optimal mode of electroconsolidation and stabilization by Y₂O₃, as well as CeO₂, NdO₂, etc., led to the production of a high density material with a high degree of homogeneity. Such characteristics provide longer life and reliability of the zirconia oxide ceramics. Hence, the zirconia oxide ceramics sintered by hot pressing method might be successfully applied in bioengineering.

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MEDICAL STUDENTS' PERSPECTIVES ABOUT DISTANCE LEARNING DURING CURRENT COVID-19 PANDEMIC

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Introduction. COVID-19 pandemic has brought significantly major challenges to educational systems around the world, especially for medical universities in Ukraine. Distance learning (DL) has become one of the most effective and possible teaching methods that keep medical students and teachers on the same track of education.

Aim. It has been more than one year since the beginning of this pandemic, so we conducted this survey to investigate medical students' perspectives about DL in Kharkiv National Medical University (KNMU).

Material and Methods. We conducted an online survey using Google Form platform distributing among all international medical students from first (spring uptake) to sixth academic course at KNMU. The survey consists of 19 questions about advantages and disadvantages of DL; students' perception about the effectiveness of DL according to the amount of knowledge they have achieved. Analysing final data was performed using Google Sheet statistical platform.

Result. Three hundred eighty-seven medical students in total had sent us their responses. According to their answers, 70% of them had their first experience with DL