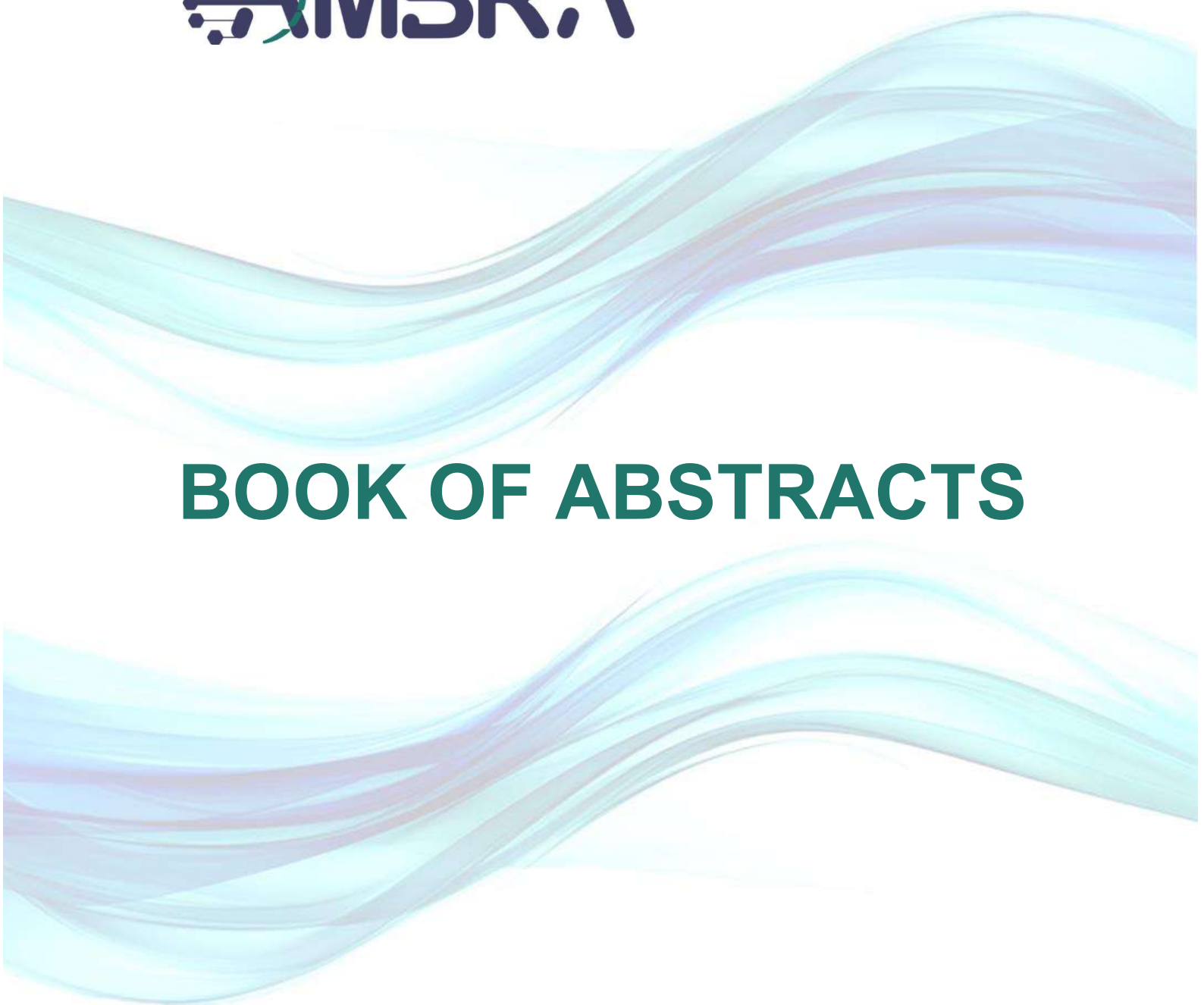




3<sup>rd</sup> International Conference on  
ADVANCED MATERIALS  
FOR BIO-RELATED APPLICATIONS  
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## BOOK OF ABSTRACTS



## ORAL TALK

3<sup>rd</sup> International Conference on Advanced Materials for Bio-Related Applications

### Characteristics of orthopaedic implants damage and mechanisms of its initiation

Grzegorz SZCZĘSNY<sup>1</sup>, Adrian ŁUKASZEWICZ<sup>2</sup>, Zbigniew L KOWALEWSKI<sup>3</sup>, Mateusz KOPEC<sup>3</sup>

<sup>1</sup> Department of Orthopaedic Surgery and Traumatology, Medical University, Warsaw, Poland

<sup>2</sup> Institute of Materials Science, Military University of Technology, Warsaw, Poland

<sup>3</sup> Institute of Fundamental Technological Research, Polish Academy of Sciences, Warsaw, Poland

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Implant fractures complicate orthopaedic procedures requiring secondary surgeries [1]. However, it is not exactly known when the damage initiation starts and which factors predispose them to the highest degree [2]. Thus, the aim of the study was to characterize changes observed in orthopaedic implants after their removal from the bone [3]. Particular efforts were made to determine, which of them occur during the process of its production, installation, usage and removal. Such identification enabled to specify the role of lesions emerging during each period and their role in the implant's deformation or fracture. The paper was focused on implants dedicated to the stabilization of the femur fractures since the bone transfers the highest loads. External surface and geometric features of eight representative implants were observed under standard and stereoscopic cameras, as well as under light and scanning electron microscopes. Macroscopic analysis of the investigated implants exhibited a number of defects in the form of scratches, abrasions, deformations and chipping. The wear degree of each implant was different and strictly depended on how it was implanted in the patient's body, as well as on how the patient exploited it through his mobility. Four different sources of implant integrity changes were identified: manufacturing-related changes, implant application-related changes, daily life-related changes and implant removal-related changes [4-5].

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