

Mechanisms and Therapeutic Approaches for Peritoneal Adhesions: A Comprehensive Review

Konstantinos Stratakis¹, Evangelos Kalogiannis², Aristomenis Thanopoulos³, Georgios Grigoriadis⁴, Spyridon Roditis⁵, Eleni G. Kaliatsi⁶, Nikolaos Nikiteas^{1,7}, Konstantinos Kontzoglou^{1,7}, Despoina Perrea¹

¹N.S. Christeas Laboratory of Experimental Surgery and Surgical Research, Medical School, National and Kapodistrian University of Athens, Athens, Greece

²Department of General Surgery, Valais Romand Hospital Center, Sion, Switzerland

³Department of Colorectal and Emergency Surgery, Barnet Hospital, Royal Free London Foundation Trust, London, UK

⁴Department of Obstetrics and Gynecology, School of Medicine, Aristotle University of Thessaloniki, Hippokration General Hospital of Thessaloniki, Greece

⁵Department of Colorectal Surgery, Royal Stoke University Hospital, Stoke, UK

⁶Department of Biochemistry, School of Medicine, University of Patras, Greece

⁷2nd Propaedeutic Department of Surgery, Laiko Hospital, National and Kapodistrian University of Athens, Greece

Abstract

Peritoneal adhesions are responsible for several and sometimes severe clinical phenotypes remaining a major problem for many patients today. Adhesions are formed within the peritoneal cavity as a result of surgery, inflammation, or injury and can cause a range of clinical symptoms, including abdominal pain, small bowel obstruction, infertility, and other complications. The incidence of peritoneal adhesions remains high as it is estimated that more than 50% of patients who undergo abdominal surgery will develop adhesions. Although advancements in surgical techniques and perioperative management have been developed, the risk of adhesion formation cannot be eliminated, and thus, the development of effective prevention strategies and treatments remains a priority in the field of surgery. In this review, we summarize the cellular and molecular mechanisms involved in the peritoneal adhesions, but also the experimental therapy approaches that have been investigated toward a solution to their possible clinical phenotypes.

Key words: peritoneum, peritoneal adhesions, biology of peritoneum, anti-adhesive factors, prevention strategies