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A SMALL AUTONOMOUS SPACE BIOLOGICAL LABORATORY: CHALLENGES,
OPPORTUNITIES, AND IMPLEMENTATION**Abstract**

Research on the influence the space environment has on live organisms is essential for human space exploration and the identification of perspectives and technical possibilities for the colonization of other space objects. This paper presents the role and scope of research in space biology as a foundation for the development of space exploration projects. A brief chronological review of humankind's achievements highlighting breakthrough undertakings from an engineering point of view is presented. A trend of miniaturization and autonomy, on the prime example of satellites in the CubeSat standard, and the latest achievements in the space biology domain, mainly in the New Space branch, is described. A comparative overview of satellite missions to this day and miniature platforms from the Space Station, which have the potential of working as autonomous space laboratories, are listed in the article. The advantages and disadvantages of these solutions, risks, and additional areas for further improvement are discussed. Based on that, features of an ideal and desired small autonomous space laboratory for providing space biology research is defined, utilizing inter alia lab-on-chip devices. Furthermore, a critical analysis of a few different platforms and flight configurations is presented.