

Unicellular organisms use gravity as an environmental guide to reach and stay in regions optimal for their growth and reproduction. These single cells play a significant role in food webs, and these factors together make the effects of gravity on unicellular organisms a fascinating and important subject for scientific study. In addition, they present valuable model systems for studying the mechanisms of gravity perception—a topic of increasing interest in these days of experimentation in space. This book reveals how single cells achieve the same sensoric capacity as multicellular organisms, such as plants or animals. It reviews the field, discussing the historical background, ecological significance, and related physiology of unicellular organisms, as well as various experimental techniques and models with which to study them. Those working on the biology of unicellular organisms – as well as in related areas of gravitational and space science – will find this book of value.

Professor Donat-Peter Häder, PhD, holds the Chair in Botany at the Friedrich-Alexander Universität, in Erlangen, Germany. He has worked in gravitational biology and space research for more than 20 years and has been involved in numerous space shuttle, sounding rocket, satellite, and parabolic flight experiments. He is the author and editor of more than a dozen books and has published more than 480 papers in scientific journals.

Ruth Hemmersbach, PhD, is a zoologist and cell biologist in the German Aerospace Center (DLR) and the Rheinische Friedrich-Wilhelms Universität in Bonn, Germany, and she has been active in gravity-related research for more than 20 years. She has been principal investigator for several biological experiments under varied gravitational stimulation in microgravity (parabolic flights and space shuttle), functional weightlessness (clinostats), and hypergravity (centrifuges).

Michael Lebert, PhD, is a botanist in the Friedrich-Alexander Universität in Erlangen, Germany who has been active in gravity-related research and computer science for 10 years. He has been involved as co-investigator in numerous biological experiments in microgravity on airplanes and sounding rockets.

Cover Photo: International Space Station
photographed during the STS 100 mission.
Courtesy of NASA.

Cover design by Alice Soloway

CAMBRIDGE
UNIVERSITY PRESS
www.cambridge.org

ISBN 0-521-82052-9



9 780521 820523 >