Prof. Shulamit Levenberg

The Prize Committee found Prof. Shulamit Levenberg worthy of the 2021 Katz Prize due to her diverse activities for implementing halacha in modern life, including the research studies she wrote and the practical initiatives she spearheaded and runs, particularly in the fields of health and nutrition.

Prof. Shulamit Levenberg is a professor at the Faculty of Bio-Medical Engineering in the Technion and the head of the Stem Cell and Tissue Engineering Laboratory. She has a BA in Biology from the Hebrew University, a doctorate from the Weizmann Institute and was a post-doctoral students in Prof. Robert Langer's laboratory at the Massachusetts Institute of Technology in Boston.

Professor Levenberg led breakthrough research on creating blood vessel networks in muscle, heart muscle, bone, spine and pancreas engineered tissues. Her research was published in more than 100 articles. The aim of her discoveries was to create tissue and replacement organs for parts of the body that were injured as a result of an accident or illness, and to enable the regeneration and rehabilitation of damaged tissues. She recently demonstrated the use of innovative bio-printing to print an edible steak containing muscle and fat.

Prof. Levenberg has won prestigious prizes, and her discoveries have thrilled the scientific community and the general public. She was awarded the Wolf Foundation's Krill Prize for Excellence in research, the Henry Taub Prize for Academic Excellence, the Juludan Prize for Excellence in Scientific Research, the French-Israeli Prize for Scientific Excellence, The Excellence for Israel Prize in Rome, the Rappaport Prize for Biomedical Sciences, the Bruno Prize, and more recently, the Peres Center for Peace and Innovation Medal of Distinction. Developments at her laboratory in the Technion led to the establishment of 3 new start-up companies: Noroxon for rehabilitating injured spinal cords, Nanosynx for rapid discovery of sensitivity to bacteria in antibiotics and Aleph Farms for generating cultured meat.

The impressive practical applications deriving from Professor Levenberg's work are thanks to her original and creative research and its far-reaching effect on daily life and medical needs.

Her research studies have included: taking individual cells from the body and reproducing the cells until a tissue has been formed that can be transplanted back into the body; creating part of a spinal cord that can be transplanted into the bodies of spinal cord injury victims; creating part of a pancreas to transplant into the bodies of diabetics; and developing muscle tissue with blood vessels to transplant into muscle injury patients. The future implications of this revolutionary research can only be imagined. Her research studies have received broad international recognition and she is considered today one of the most influential women in the world of science.

In recent years, Professor Levenberg has expanded her research to the field of cultured meat. By using the techniques developed in her laboratory for forming tissues on three-dimensional scaffolding, she has been examining the possibility of taking individual cells from a live animal and creating edible meat tissue (such as muscle and fat). The success of this initiative will surely create a new market in the world for meat that does not require an animal to suffer as it is growing and when it is slaughtered.

The advantage of lab-grown meat is not solely due to stopping the suffering of animals, but also to obtain healthier meat so the world will be healthier. The meat will be healthier because it will not be susceptible to disease and will not require drugs and vaccines. The world will be healthier, since the industry of raising a herd extracts a heavy price from world ecology. A side benefit to developing cultured meat is that it might significantly reduce this industry.

Cultured meat has given rise to many questions in halacha. Is cultured meat considered actual “meat”? Is there a problem of *ever min hachai*, a concern that it involves consumption of an animal organ taken from a live animal because the cells were taken from a live animal? What is the law of a liquid derived from blood which are fed the cells to make them reproduce? Is *bitul b’rov*, making it lose its status in the cell mixture to allow it to be eaten with the cells, permitted, or is it *a priori* forbidden? Perhaps even eating the meat is prohibited?

In order to deal with these questions, Prof. Levenberg (with the assistance of Aleph Farms and Rabbi Prof. Zibotefsky), turned to Rav Asher Weiss. Rabbi Weiss, the author of the Minchat Asher series and the rabbi of the Shaare Zedek Hospital, is known and accepted by all levels of the observant public, and all consultations were made with him. For more than a year and a half, Prof. Levenberg has been maintaining an ongoing correspondence with Rav Asher Weiss, who has been grappling with the many questions raised by the revolutionary innovation of cultured meat.
About a year ago, Rav Weiss published an answer relating to the three main questions raised above. The rav ruled that the meat would have the status of meat, that there was a concern of *ever min hachai* -- consuming an animal organ from a live animal, and it was not prohibited to use the liquid produced from the blood. After a few months he published another responsa, in which he related to other aspects of lab-grown meat production. The correspondence continues, and we hope with the help of Hashem that in the near future, Rabbi Weiss will completely elucidate the topic and clarify the issue for the cultured meat industry.

The research into cultured meat has created an encounter between twenty-first century modern science and the Torah, and the need to relate to these issues ideologically and halachically. The Beit Midrash of the Lev Academic Center headed by Rabbi Yosef Zvi Rimon also began in recent months to deal with this topic. Rabbi Rimon contacted Prof. Levenberg to more profoundly understand the scientific aspects of this issue.

For her daring, imaginative and practical research and inventions, and for clarifying the halachic issues unique to them, the 2021 Katz Prize Committee decided to award Prof. Levenberg the Katz Prize For Applying Halacha to Modern Life.

In consideration of all the above, the selection committee has decided to award Prof. Shulamit Levenberg the Katz Prize for 2021.

Professor Menahem Ben-Sasson Rabbi Shlomo Dichovski Rabbi Haim Sabato