

The International Debate on Biodegradable Biofoam Produced From Genetically Modified Organisms

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Natural biomaterials are usually made from plant and/or animal sources; however, they can pose some disadvantages including unpredictable availability due to weather conditions, pests and/or diseases, fluctuations in costs, as well as competition from human demand (e.g., food, fibers). Therefore, we are one of the first to produce genetically synthesized biofoams. The process is carried out by assembling different natural and synthetic genetic parts including genes and proteins, which are cloned in a known pathogenic yeast or bacteria, to produce target proteins and/or biomolecules useful in producing biofoams. The key elements for assembling the genes for the production of the biofoam is the selection of the natural source of the genes, the types of genes, the types of vectors, and the type of microor-

ganism that host the DNA construct or genetic ingredients that produce the biofoam. Another important aspect of biofoam production is the fermentation process, which provides good growth of the microorganism and increased yield of the biomaterials useful in the production of the biofoam. Furthermore, the biofoams can be made with inherent antimicrobial ingredients. We were able to make biofoams of different sizes and textures useful in a variety of different applications including cups for beverages, pots for agricultural use, laminar material for book or paper protection, as well as materials for seat cushions in automobiles, aircraft, and furniture. Additionally, the genetic biofoams can be used as an insulating material as well as for stimulating plant germination.