OPPORTUNITIES FOR APPLYING BIOMEDICAL PRODUCTION AND MANUFACTURING METHODS TO THE DEVELOPMENT OF THE CLEAN MEAT INDUSTRY

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Clean meat (meat grown using cell culture methods, rather than obtained from animal slaughter) is an emergent biotechnology industry that will ameliorate the serious environmental, sustainability, global public health, and animal welfare concerns of conventional animal agriculture. Critical Technology Elements (CTEs) for clean meat include immortalized cell lines for meat animals (e.g. chicken, pig, cattle, and turkey), xeno-free media optimized for proliferation and maturation of these cell lines, edible or biodegradable scaffolding for tissue engineering, and efficient bioreactors for cell proliferation and differentiation.

While many biomedical products and tools can already be applied to the CTEs of clean meat, the opportunities to expand biomedical product lines are considerable. Large-scale cell culture for clean meat production presents a number of unique requirements that are not currently met with existing products for the biomedical industry. Namely, cost constraints and scale requirements for the clean meat industry are notably different than for cellular therapeutics or regenerative medicine, and innovation is needed to develop products that are optimized for the cell types and structures that are relevant for clean meat.

Further, developing these tools for clean meat would simultaneously advance the technology and reduce costs for the biomedical and therapeutic applications. We will discuss new applications for current biomedical products and manufacturing methods for clean meat and discuss potential for symbiotic and synergistic product development through partnerships between researchers, biomedical product manufacturers, and the emergent clean meat industry.