Executive Summary

Overview: CARMA Therapeutics is a pre-clinical stage biotechnology company developing novel cellular therapeutics.

- Platform technology confers antigen-specific recognition to macrophages, creating novel cellular therapeutics, CARMA™, with an initial focus in oncology.
- Patent protected technology developed at the University of Pennsylvania, a world-leading institution in cancer immunotherapy.
- Targeting IND filing to begin initial human testing in solid tumors in 2018.
- Experienced biotechnology leadership supporting scientific founders.

Recent technical advances have made genetic engineering of human immune cells for the treatment of cancer feasible. T cells engineered to express a tumor-recognizing receptor have shown outstanding success in some leukemia and other hematological malignancies. However, such results have not been successfully translated to solid tumors. This observation calls for a fresh look at solid tumor immunotherapy.

The CARMA™ platform applies powerful chimeric antigen receptor technology and adoptive cell transfer, two techniques with an established clinical track record in cancer therapy, to macrophages, immune cells that readily infiltrate the solid tumor microenvironment. CARMA Therapeutics plans to bring to the clinic a novel method to genetically manipulate human macrophages with high efficiency to achieve targeted anti-tumor function. Ample *in vitro* and *in vivo* data (animal models) demonstrate ability of CARMA™ to traffic to solid tumors and to selectively eliminate tumor cells, leading to eradication of tumors in animal models. The CARMA™ platform is the subject of broad intellectual property filings.

Development plans: Current development plans schedule IND filing in 12 months, and first enrolled patient within 18 months pursuing a first indication in a recurrent solid cancer. The company is building a pipeline of products in additional solid tumor indications, next-generation cellular products, combination immunotherapy approaches and genetically engineered off-the-shelf products. The company growth and value-creation strategy includes partnering of one or more of the preclinical programs with more established players in adjacent spaces.

Competitive advantage: Unique proprietary technology grounded in synthetic biology and a deep understanding of tumor immunology. Intellectual property confers a strong blocking position in the field of CAR use in myeloid cells. Our platform approach enables a robust pipeline of products and strong partnering value creation opportunities. The technology was developed by leaders in cellular therapy from the University of Pennsylvania's Center for Cellular Immunotherapies, which is directed by Dr. Carl June. CARMA Therapeutics plans to remain lean in the first 24 months of operation by leveraging the University of Pennsylvania's infrastructure and experience in cellular therapy development and manufacturing, regulatory affairs and clinical testing.

Team: Bruce Peacock, Executive Chairman, over 35 years of biopharmaceutical leadership experience with public and private companies including Ophthotech Corporation, Adolor Corporation, Orthovita, Inc., Cephalon, Inc. and Centocor, Inc. Saar Gill, MD, PhD, SAB, co-founder, clinical oncologist with regulatory expertise and PI on current CART cell trials. Michael Klichinsky, PharmD, PhD Candidate, SAB, co-founder, developed CARMA under mentorship by Dr. Saar Gill and Dr. Carl June. Dora Mitchell, PhD, director, 10 years of experience in pre-clinical and clinical development and operations at early stage companies including Chip Dianostics, Inc., Cytovas LLC, Lignamed LLC, Linnaeus Therapeutics, Inc., NellOne Therapeutics, Inc.