

**Baolin Zhang's Achievements
since his Site Visit on January 12, 2016**

On January 12, 2016

Dr. Baolin Zhang's research program entailed:

- **The identification of biomarkers for predicting tumor response to a new class of protein products targeting death receptors including TNFR1, Fas, DR4 and DR5.**
- **The development of methods for profiling glycosylation variants in therapeutic proteins.**
- **The development of methods for the detection of biological toxins (ricin and Abrin) in environmental samples.**
- **Investigations of the aggregation of therapeutic monoclonal antibodies in human plasma.**

Dr. Zhang's Ongoing Research Projects

Dr. Zhang continues investigating the mechanisms of action of anticancer drugs and the pathways leading to tumor resistance to those drugs. This includes an understanding of how protein modifications, especially glycosylation and aggregation, affect the safety and efficacy of therapeutic proteins.

Specific aims of the research projects:

- 1. Identification of predictive biomarkers of drug-induced cardiotoxicity.**
- 2. Molecular profiling of circulating tumor cells (CTCs) towards predictive cancer biomarkers.**
- 3. Elucidate the mechanisms whereby cancer cells resist death receptor targeted therapy.**
- 4. Develop methods for the detection of ricin toxin in environmental samples.**
- 5. Develop and improve methods for glycan profiling of therapeutic proteins.**
- 6. Assess modifications of therapeutic proteins in human plasma.**

Publications

Dr. Zhang's lab has published two research articles and one book chapter since the site visit on January 12, 2016.

- 1. Lei Zhang, Shen Luo, and Baolin Zhang (2016) Glycan analysis of therapeutic glycoproteins. *mAbs*, 8(2), 205-215.**
- 2. Lei Zhang, Shen Luo, and Baolin Zhang (2016) *The use of lectin microarray for assessing glycosylation of therapeutic proteins*. *mAbs*, 8(3), 524-535.**
- 3. William P. Bozza, Julianne D. Twomey, Su-Ryun Kim, and Baolin Zhang (2016) *Detection of apoptosis: From bench side to clinical practice (Book Chapter)*. *Apoptosis Methods in Toxicology*, p13-29, Springer.**

Manuscripts in preparation

1. Liqun Zhao and Baolin Zhang (2016) *“Doxorubicin induces cardiotoxicity through upregulation of death receptors in cardiomyocytes.”*
2. Su-Ryun Kim and Baolin Zhang (2016) *“A novel role for the wild-type H-Ras GTPase in regulating death receptor mediated apoptosis.”*
3. William Bozza and Baolin Zhang (2016) *“Bypassing cancer resistance to apoptosis through targeted delivery of active caspases-3.”*
4. William Bozza, Yaqin Zhang, Shen Luo, and Baolin Zhang *“Keratin 8 confers cancer resistance to death receptor mediated apoptosis.”*
5. Julianne Twomey and Baolin Zhang (2016) *“Targeted cancer therapy: 20 years and counting.”* (Invited review)

Dr. Zhang's Presentations at Local Meetings and National and International Conferences

1. Invited Speaker *"The roadmap to precision medicines: Predictive biomarkers for targeted cancer therapies"*. Markets and Markets (MnM) Conferences on Biomarkers. San Diego, CA, Feb 18-19, 2016.
2. Invited Speaker *"Potency assays for biopharmaceuticals: A regulatory perspective"*. Biotherapeutics Analytical Summit. Washington DC, Mar 15-16, 2016.
3. Session Chair, Part 2: Advances in Characterization Methods and Approaches, Biotherapeutics Analytical Summit, Washington DC, Mar 15, 2016.
4. Speaker *"Multiple-Attributes Methodology (MAM) for assessing therapeutic proteins"*. OBP Division IV Staff meeting, White Oak, April 12, 2016. (Speaker)
5. *"Co-development of cancer therapeutics and companion diagnostics"*, FDA Biomarker working group meeting, White Oak, May 12, 2016.
6. *"Crosstalk between H-Ras GTPase, autophagy, and death receptor mediated apoptosis"*. Gordon Research Conference on Cell Death: New concepts in cell death research: From basic mechanisms to clinical opportunities. Girona, Spain, July 3-8, 2016.
7. *"Integration of predictive biomarker in the development of targeted cancer therapy"*. Gordon Research Conference on Personalized Medicine, Hong Kong, July 10-15, 2016.

FY17 Grant Proposals

Dr. Zhang submitted two grant proposals:

FY17 Chief Scientist Grant: Predicting cardiotoxicity of oncology drugs in individual patients.

FY17 Office of Women Health Grant: Identifying molecular signatures of circulating tumor cells to improve breast cancer therapy.

Regulatory Work

Dr. Zhang continues working as a Primary reviewer for novel biotechnology products submitted as Investigational New Drug applications (INDs) and Biologic License Applications (BLAs). These include original pre-INDs, INDs, IND amendments, annual reports, and BLA supplements.

Since Feb 2016, Dr. Zhang also works as a Secondary Reviewer (Team Lead) with the responsibility of overseeing a review team consisting of three primary reviewers.

FDA Special Assignments

Vice Chair of the FDA/CDER Regulatory Science & Review Committee (RSR).

- Led the RSR Committee in the review of FY16 RSR proposals (total 35 proposals across the Center).
- Played a key role in the selection of proposals for FY16 RSR funding.
- Recruiting RSR committee members.
- Planning for FY17 RSR cycle.

FDA/CDER Biomarker Qualification Review Team.

- Reviewed amendments to an ongoing biomarker qualification program for the evaluation of circulating tumor cells (CTCs) as predictive biomarkers of cancer treatment outcomes.
- Participated to face-to-face meetings with the Sponsor.