

OFFICE OF REGULATORY AFFAIRS (ORA)

Office of Regulatory Science (ORS)

Office of Research Coordination & Evaluation (ORCE)

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NCTR Science Advisory Board Meeting

4.Dec.2018 – 5.Dec.2018

Little Rock, AR

Regulatory Mandate of ORA



To protect consumers and enhancing public health by maximizing compliance of FDA regulated products and minimizing risk associated with those products.

Mission of Office of Regulatory Science (ORS):

To serve as the ORA headquarters for scientific and technical staff and provide leadership and resource management to ORA's network of national laboratories at 13 different geographical locations.

Mission of Office of Research Coordination and Evaluation (ORCE)



- ***ORCE Immediate Office*** – Leading ORA Science
- ***Research Group*** – Shaping Landscape of Regulatory Research
- ***Quality Group*** – Increasing Confidence in Execution of Core Scientific Mission



Responsibilities of ORCE

- Elevate ORS science, research and quality activities through active leadership, engagement with Center stakeholders, academic collaborators, and sister agencies.
- Define new areas of work for ORS labs, introduce new technology, expertise and continuously expand scientific portfolios to remain mission-relevant, forward-looking, cutting-edge and versatile.
- Establish a framework of harmonized processes that define criteria for generation of scientific publications, external presentations, scientific contracts/agreements, and research proposals.
- Promote peer review-based career advancement through recognition of scientific accomplishments.
- Work with ORA's Office of Quality System Management to establish a robust laboratory quality management program, provide rigorous scientific assessment of our lab activities as part of pre-audit visits, evolve and modernize our proficiency testing program, improve management reviews and promote quality as a key factor in achieving confidence in our lab products.

Research Coordination/Evaluation Accomplishments



- **Revitalization of Research Proposal Tracking Tool**
 - Establish consistent use of tool
 - Bring transparency to research activities
 - Inform research resource decisions (work plan, etc.)
 - Refine proposals for better alignment with mission/agency priorities
 - Meaningful review of research
 - Achieve alignment with Center priorities, Agency mission
 - Close-out reports – bring visibility to how work is concluded
 - Very important – goes towards metrics
 - Verification of research goals, informs metrics
- **Building a Strong Scientific Research Team at ORCE HQ**
 - ORCE group was stood up formally in May, 2016 and was built from scratch to a current group of 7 high-performing individuals.

Research Coordination/Evaluation Accomplishments



- **Master Review Process**

- Review of ORS laboratory scientific products
 - one of the core responsibilities of ORCE
- Master Review Process is being stood up, which formalizes:
 - Submission process
 - Tracking process of review timelines
 - Notification process with all stakeholders included
 - Database of published manuscripts
- Coverage:
 - Laboratory Information Bulletins (LIBs), manuscripts, collaborative research agreements (CRADAs/RCAs) and scientific memoranda of understanding (MOUs)
 - External presentations

- **Building Extended ORCE Research Community**

- ORA labs represent a community of 900+ people and about 60-70 of these are research dedicated personnel. ORCE would like to foster the concept of an extended ORCE research community that includes the researchers in the field.
 - Inaugural ORCE Research Meeting (27 – 28 June 2018)



Research Interests

Chart on next slide depicts abbreviations for specialized ORA labs at the top and areas where each lab has active research in are indicated by colored boxes. Note that ORA labs are specialized along regulated product lines such as food/feed testing specialized labs, medical products testing specialized labs, etc.

- **Legend:**

Blue: Food/Feed related research

Green: Medical Products/Tobacco related research

Purple: Cross-cutting program research



Regulated Sector	Program Area	SEL HAF	SEL Tobacco	NEL HAF	NEL MP	PSW HAF	PSW MP	AL	DEN	KAN	PNW	SFL	PHI	SJN	DET	WEAC	FCC	
Foods & Feeds	Veterinary Drug Residues	█		█		█		█	█									
	Color & Food Additives	█		█					█			█						
	Metals Testing	█								█		█					█	
	Filth	█		█		█		█			█	█						
	Food Microbiology	█		█		█		█	█		█	█						
	Mycotoxins	█								█	█							
	Persistent Organic Pollutants							█										
	Pesticides			█		█		█				█						
	Radioisotopes in Foods																█	
	Sensory/ Decomposition	█		█		█		█				█	█					
	Total Diet Study								█		█						█	
	Allergens	█		█		█			█	█								
	Dietary Supplements	█									█	█						
	Nutritional Analysis	█																
Pharmaceutical Products	Compounding Pharmacy				█		█										█	
	Cooperative Research and Development Agreement				█								█	█	█			
	Drug Chemistry				█		█						█	█	█			
	Drug Microbiology				█		█								█		█	
	Metals Testing				█		█										█	
	Pharmaceutical Adverse Events & Outbreaks				█		█						█	█	█		█	
	Shelf Life Extension Testing												█	█	█			
	Spiked Active Pharmaceutical Ingredients in Dietary Supplements						█								█		█	
	Sterility				█		█									█		
Devices and Radiological Health	Routine Surveillance of Gloves and Condoms															█		
	Specialized Engineering Testing on Medical Devices															█		
Tobacco Products	Tobacco Counterfeit Testing, OCI Investigations																█	
	Tobacco Flavors, Contaminants, Products Standards Testing, Substantial Equivalence Testing		█															
All Sectors	Analysts on Inspection	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	
	Private Lab Reviews	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	

ORCE Principles for Shaping Research Landscape



- What is good science?
- What is mission-relevant work?
- What is impact?

Unanticipated Challenges: Re-Directing Projects



Dr. Peabody took on the most challenging research projects.

Not having a pre-conceived conclusion

Preserving objectivity, even when hard-earned results prove the opposite of what you set out to show.

Not giving into pressure of time

Properly validating/reproducing results to guard against “flukes”

Anticipating Future Needs: Current Risks Born From Advancing Technology



New Products

Products containing nanomaterials or protein moieties

Immunogenicity

Toxicity

Excipients

Unknown contaminants

How to translate traditional tests to complex formulations – dissolution of biotech products?

Biosimilars - Concept of “highly similar, interchangeable, no clinically meaningful differences”

Generics – equivalency via non-clinical tests

Animal Products Derived from Stem Cells – factors of quality?

New Manufacturing Techniques

Continuous manufacturing

3-D printing

New Scientific Techniques for Product Characterization/Development

***In silico* modeling to determine ADME (absorption, distribution, metabolism, excretion) or contaminant leaching profiles**

Organs-on-a-chip to determine toxicology profiles

***In vitro* biomarker testing**

New Regulations/Policies

Elevation of ORA Science

- Significant new work brought in from product Centers
 - CDER
 - heparin work on NMR
 - analysis of transdermal products
 - inhalers testing
 - use of LC-MS technologies to detect impurity as part of compendial methods
 - products using continuous manufacturing
 - complex combination products (drugs/device)
 - CFSAN
 - chemical markers of seafood decomposition
 - multi-analyte allergen methods
 - CDRH
 - gown integrity testing
 - detection of microbial contamination in reusable devices
 - heating/cooling device failure modes
 - investigation of effect of aerosols from 3D printing

Elevation of ORA Science



- Scientific representation at agency-level committees
 - Senior Science Council
 - Emerging Sciences Council
 - Nanotechnology Network
 - Additive Manufacturing Workgroup
 - FDA Mass Spectrometry Workgroup (chaired by ORA)
 - CERSI Objective Review Panel
 - Knowledge Management Council
 - Shared Resources Council
 - Prenatal Health Center of Excellence
- Development of ORCE Concept of Operations document
 - To codify ORCE's scientific leadership responsibility, strategy, and vision

Areas of Current Collaboration and Intersection with NCTR



- Sunscreens – ORA has founded the intra-agency Workgroup on **S**unscreen **O**perations – **L**aboratory **A**nalysis and **R**esearch (SOLAR) whose purpose is to coordinate efforts on sunscreen products among research, compliance, surveillance and regulatory testing components across the Agency; to develop intelligent analytical tools for monitoring products; to coordinate generation of data to inform guidance for industry.

Areas of Current Collaboration and Intersection with NCTR



- Nanotechnology – across all products
- Prenatal Health Center of Excellence
- Alternative Toxicological Methods Roadmap

Potential Areas of Future Collaboration with NCTR



- Toxicological assessment to inform method development efforts on novel analytes of interest – method performance parameters such as sensitivity are derived from risk accrued from specific exposure levels.
- Establishing collaborations where ORA labs can leverage their analytical tools and expertise to be integrated into research on fundamental topics which otherwise they don't pursue on their own.

