Segment 1: Pain Relievers and Gain Creators

Key pains related to process and results in identifying and selecting research questions, summarized from 4Q analysis:
- Miss unfamiliar disease areas
- High investment required and high risk in unfamiliar areas
- High time and effort required to review literature in different areas
- Disagreements with collaborators due to limited information

→ **Pain relievers** from involving crowds?
- Diverse crowd members can explore and identify many potential areas
- Faster learning, reduced risk due to knowledge of crowd
- Less review of literature required if crowd identifies research questions
- Fewer disagreements due to better information, external input and recommendations

Key gains related to process and results in identifying and selecting research questions, summarized from 4Q analysis:
- Disease area we focus on is important
- Insights are generalizable to other disease areas
- Research questions fit with existing project portfolio
- Potential users would like to shape methods towards their needs

→ **Gain creators** from involving crowds?
- Crowd ideas and knowledge might point towards highest payoff areas
- Crowd knowledge may help us understand similarities between areas and potential generalizability of issues
- Crowd can shape research to make it more relevant, increasing potential adoption of the method
- Learn about other new methods to study protein-protein interactions
- May get access to materials and collaborators for next stages of the research

Segment 2: Strategic Design Choices

Crowd Science Paradigm Diamond (Why involve a crowd?)
- Crowd volume: Less relevant
- Broadcast search: Very relevant
- User crowd: Very relevant
- Community production: Very relevant
- Crowd wisdom: Less relevant

AKRD Crowd Contribution Matrix (What does the crowd contribute?)

Activities	Attend workshop, present current methods, brainstorm about my new approach and potential RQs in co-creation session; describe current methods in workshop application form
Knowledge	Knowledge about disease areas; current methods to study protein-protein interactions
Resources	Transportation to workshop (I will pay for accommodation, meals)
Decisions	Generate decision options (different disease areas, specific issues to focus on); I will select

Six Crowd Characteristics (Who is the crowd?)
- Location: Different countries with strong research institutions
- Knowledge and skills: Knowledge of disease areas, current methods, methods requirements
- Time commitment: High (2 days)
- Resources: Access to travel
- Size: Medium (100) → 30 is more realistic
- Diversity: Diverse with respect to disease areas and current methods

Segment 3: Implementation Challenges and Solutions

Key challenges and solutions specific to this particular stage of the project:
- Lack of prior knowledge: No problem – they are experts in disease areas; I will tell them basics of my new method
- Generating well-structured questions: No problem – they are experts
- Representativeness: Less important with respect to preferences

Organizational challenges and solutions that cut across all stages (see chapters 13–14):
- Dividing and allocating tasks: Carefully planned workshop, including talks, co-creation sessions, roles for participants; I will assign people based on info from application form
- Coordinating crowd members: Organizer team as part of the workshop; hire professional moderator
- Training and enabling learning: Not needed
- Increasing quality and evaluating contributions: Well-planned script for co-creation sessions, professional moderator; take detailed notes, evaluate ideas in team afterwards
- Motivating crowd members: Learning and new collaborations; I pay for accommodation and fancy dinner; superstar-advisor as co-organizer
- Recruiting crowd members: Personal networks, listservs of associations, authors on relevant recent articles

Research integrity and ethical issues that cut across all stages (see chapter 15):
- Ensuring quality and preventing misconduct: Less relevant
- Recognizing effort and sharing project outputs: Disclose that RQ generation is a goal; potentially offer acknowledgements and co-authorship if collaborations emerge
- Role of AI: Automation, augmentation, management: Not needed
- Privacy, safety, institutional oversight: Nothing special – workshops are standard in the broader field