

Bioengineering Day Poster Addendum (ABET questions)

1. List two to four **Desired Needs** of your project that led to your final design objectives.
Answer in two to four bullet points or concepts within a sentence or two.
 - To track T cell migration, target localization, and treatment response
 - Reduce ex vivo manipulation that can alter T cell phenotype and in vivo functionality
 - Increase labeling efficiency

2. List the major **Constraints** on your design/project
 - a) *Safety/Regulatory Affairs*: Nanoparticle biocompatibility and FDA approval requirements.
 - b) *Risks*: Potential alteration of T cell function or off-target uptake.
 - c) *Global Impact*: High cost and MRI infrastructure requirements.
 - d) *Manufacturability*: Scalable and reproducible SPION synthesis/conjugation.
 - e) *Quality Control/Marketability*: Consistent labeling efficiency and clinical benefit over existing methods.

3. List the major **Engineering Standards** on your design/project
 - ISO 10993 standards for biocompatibility of medical devices to manage biological risk.

4. Explain **Ethical, Environmental, or Societal concerns** for practical applications of your project.
 - High treatment and imaging costs may limit equitable access to advanced cell therapies.
 - Potential safety concerns regarding long-term nanoparticle accumulation and effects in patients.
 - Environmental concerns associated with nanoparticle manufacturing and disposal processes.

5. Describe **Active Teamwork and Leadership** in your design group
 - a) **collaboration** and inclusion of diverse opinions?
 - Our team maintained open communication and considered different viewpoints when making design and research decisions.
 - b) **delegation** of leadership on subprojects?
 - Responsibilities were divided based on individual strengths, with different members leading areas such as background research, visual design, and technical analysis.
 - c) establishing and reaching **goals and deadlines**?
 - We set project milestones throughout the quarter and regularly checked progress with our mentor to stay on schedule.
 - d) received or given **constructive feedback**?
 - Team members reviewed each other's work and met with our mentor weekly for suggestions to improve accuracy, organization, and presentation quality.

6. What were the most significant motivating factors that led you to
 - a) acquire **new knowledge**
 - Need for understanding before designing
 - b) be **self-initiating**
 - Interest in connecting nanomaterials and immunology
 - c) **persist** against challenges and setbacks.
 - Desire to share and present a working solution to my peers

7. What are your most **innovative and/or entrepreneurial ideas** for this project
 - Build a platform technology for real-time immune monitoring, enabling hospitals to track and adjust immunotherapy in patients longitudinally.
 - Develop bi-specific antibody targeted nanoparticles for more specific cell subsets.