# JAHNAVI SHAH

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## EDUCATION

**Rutgers University, School of Engineering**, New Brunswick, NJ
B.S. in Biomedical Engineering, May 2025, GPA: 3.656

## AWARDS

Dean's list, AP Scholar with Honor Award
School of Engineering Scholarship 2022-23, Stephen L. and Julia K. Albertalli Scholarship 2023-2024
AP Scholar

## RELEVANT COURSES

| | |
|---|---|
| Systems Physiology | Drug delivery phenomenon |
| Biomedical Thermo and Kinetics | Calculus |
| Physics | Organic Chemistry/Lab |
| Biology | MATLAB |
| Biomaterials | BME Numerical Modeling |
| BME devices & systems | Biomechanics |

## WORK EXPERIENCE

**RWJBH Somerset ED Medical Scribe (June 2025-Present)**

- Collaborate closely with physicians and physician assistants to document patient encounters, including history of present illness (HPI), ED course, treatments, and diagnoses.
- Accurately track patient disposition and route through the ED to support efficient clinical workflow.
- Gain exposure to a wide range of emergency procedures, including intubation, CPR, laceration repair, and incision and drainage of abscesses.

**R&D Co-op at Ethicon Inc., J&J in topical skin adhesives lab (January 2024-May 2025)**

- Optimized adhesive synthesis and formulation processes for next-generation skin-applied medical adhesives.
- Synthesized Karstedt catalyst and characterized reaction progress using FT-NIR, Raman spectroscopy, and $^{1}$H-NMR; investigated alternative reaction pathways to reduce overall synthesis time.
- Conducted mechanical evaluations of formulations, including gel time measurements, viscosity profiling, and rheological analysis.
- Performed peel testing and mechanical testing of pressure-sensitive adhesives (PSAs); contributed to PSA formulation development and optimization.
- Applied statistical analyses to experimental data and designed 3D-printed prototypes for controlled PSA deposition.
- Characterized skin–adhesive interactions using biophysical skin probes to evaluate adhesion performance and product–skin interface behavior.
- Developed Python-based predictive models to forecast adhesive performance on specific skin types using input parameters such as hydration, TEWL, cutometer elasticity, and pH.
- Prepared technical reports and scientific documents; presented data and findings to cross-functional R&D teams.

**Gujarati Interpreter, MPC. Interpretation (January 1 2024-Current):**

- Skilled in facilitating accurate and culturally sensitive communication between Gujarati patients and healthcare providers across various medical specialities.

**Research Lab Under Dr. Suneel Kumar and Dr. Francois Berthiaume (September 2022-Current)**:

**Major work**:

- Conducted in-vitro studies to evaluate MSH-ELP (melanocyte-stimulating hormone–elastin-like polypeptide) for its ability to promote cell migration and proliferation in wound-healing models.
- Performed scratch assays to assess the biological activity of α-MSH, including fluorescence-based quantification of cell movement and growth.
- Designed and 3D-printed a custom stamp-style scratching tool to create uniform "wounds" and engage a larger number of cells in each well, improving consistency and physiological relevance of the scratch assay.
- Fabricated polyelectrolyte complex (PEC) films and optimized synthesis parameters for controlled degradation and sustained release of MSH-ELP.
- Carried out degradation studies, fluorescence release assays, and western blot analyses to characterize hormone release profiles and verify protein integrity.

**Research Paper/Review/ Book chapter**:

- Recent Advancements in Chitosan Based Polyelectrolyte Complexes for Wound Healing Applications
  **Jahnavi Shah**[#], D Patel, D Rananavare, D Hudson, M Tran, R Schloss, N Langrana, F Berthiaume, S Kumar*[#]
- Bioengineering and Synthetic Microbiota for Skin Care to Human Microbiota for Skincare
  Suneel Kumar*#, **Jahnavi Shah***, Ashley Mathew*, Sara Varghese*, Amirthavarshini Subburaman, Francois Berthiaume (Not published yet)
- Coacervates Made of Elastin-like Polypeptides Fused with MCP and MSH Enhance Skin Wound Healing in Spinal Cord Injured Mice
  Suneel Kumar*, Dhruv Patel, Greeshma Manjunath, Shashank Madhavan, Ashley Mathew,
  Dnyaneshwari Rananavare, **Jahnavi Shah**, Francois Berthiaume* (Not published yet)
- Nanoparticle-infused Polyelectrolyte Film Promotes Chronic Wound Healing Following Spinal Cord Injury (Not published yet)

[#*]First Author

**Poster Presentation:**

- *Kungumaraj H, **Shah Jahnavi**, Kumar S, Berthiaume F. Development of a Slow Drug Delivery System for Pressure Ulcers Healing after Spinal Cord Injury.
- ***Jahnavi Shah**, Haripriya J. Kungumaraj, Francois Berthiaume, Suneel Kumar Development of Polymer-based Drug Delivery System for Wound Healing
- *Kumar S, Patel D, Manjunath G, Madhavan S, **Jahnavi Shah**, Rananavare D, Mathew A, Berthiaume F. Early wound phase modulation using self-assembled nanoparticles for pressure wound healing after spinal cord injury

*Presenting author

**Shadowing Dr. Ketankumar Vaidya (June 2023-August 2023):**

- Completed over 100 hours of clinical shadowing with an internist and geriatrician, observing a wide range of diagnostic evaluations and patient interactions.
- Gained exposure to management of complex medical conditions in adult and elderly populations.
- Observed clinical decision-making, patient communication, and longitudinal care in an outpatient setting.

## ACTIVITIES

**Clubs**:
Member of Biomedical Engineering Society (2022-2025)
Member of American Cancer Society (2022-2025)
Member of Health Occupation Students of America club. (2022-2025)
Peer Leader for Calculus 1 (2022-2023)
RWJBH Adult ED Volunteer (2024-2025)

## SKILLS

**Technical Skills:** MATLAB, Python, Excel, SOLIDWORKS, 3D printing, ImageJ, Minitab, ANOVA and Tukey's test.
**Lab Skills:**

- Analytical & Spectroscopic Techniques: FT-NIR, Raman spectroscopy, UV-Vis spectrophotometry, ELISA, BCA protein assay, SDS-PAGE/gel electrophoresis, Western blotting.
- Materials & Adhesive Characterization: Rheology, viscosity testing, Instron mechanical testing, peel testing, gel-time measurement, and pressure-sensitive adhesive (PSA) formulation.
- Polymer & Silicone Systems: Synthesis and optimization of silicone-based medical adhesives; Karstedt catalyst synthesis and characterization; fabrication of polyelectrolyte complex (PEC) films for wound-healing applications.
- Cell Culture & Bioassays: Maintenance of fibroblast and HaCaT cell lines; media changes, passaging, and detachment; in-vitro scratch assays; fluorescence-based release assays; quantitative imaging and analysis using ImageJ.
- Prototyping & Deposition Methods: 3D printing of custom assay tools and prototypes; spray-coating techniques for adhesive and film deposition.
- Skin & Interface Characterization: Use of biophysical skin probes to assess skin properties and evaluate product–skin interactions.

**General Skills:** Critical Thinking, Scientific Writing, Statistical Analysis, Problem solving, Proficient in English, Hindi, and Gujarati, Elementary level in French and Spanish.