

Intellectual Merit Criterion

Overall Assessment of Intellectual Merit

Excellent

Explanation to Applicant

Strengths: the applicant is highly focused on research in the area of material characterization. Applicant has developed a keen expertise in characterization equipment and techniques. Strong publication record. Application is likely to become a leader in the field. Weaknesses: none perceived.

Broader Impacts Criterion

Overall Assessment of Broader Impacts

Excellent

Explanation to Applicant

Applicant's research goals have a strong environmentally friendly and sustainability component. Applicant is not only scientifically savvy, but also socially aware. Applicant appears to be a natural leader. Applicant's research area is highly important to future technological growth. Applicant shows a clear understanding of how future problems in the area can be addressed through proposed research. Weaknesses: none perceived.

Summary Comments

The applicant is highly focused on research in the area of material characterization. Applicant has developed a keen expertise in characterization equipment and techniques. Strong publication record. Application is likely to become a leader in the field. Applicant's research goals have a strong environmentally friendly and sustainability component. Applicant is not only scientifically savvy, but also socially aware. Applicant appears to be a natural leader. I perceive no weaknesses in applicant's submission.

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Explanation to Applicant

+Impressive list of awards (Goldwater, McNair, and other internal fellowships) +Multiple papers as co-authors and presentations. The previous research experiences, focusing on characterization of conjugated polymers, are relevant to proposed research +Wide range of experimental expertises (SAXS/WAXS) +Multiple years of research experience in one lab and a summer research internship at another institution -Unclear of the level of involvement in designing experiments that led to co-authored publications +Research proposal is well written with clear experimental procedures and plans. -However, the proposed work seems to be heavily inspired by previous work and the novelty is unclear.

Broader Impacts Criterion

Overall Assessment of Broader Impacts

Excellent

Explanation to Applicant

+Clear dedication to improving inclusion and diversity. Served as president of a student group and started new initiatives to

improve diversity. +Clear career aspiration and dedication to help underrepresented students -Providing a clear plan for broader impact for graduate career will strengthen this application +Will be a strong role model for first-generation, non-traditional student

Summary Comments

This applicant is incredibly strong and has demonstrated the ability to perform impactful research. Previous research experience had produced publications. The applicant has shown to be able to perform well in multiple research groups. The letters of support spoke extremely highly of the applicant. While the research proposal is heavily inspired by the previous work, there is no doubt of the applicant's potential productivity and success as a graduate student.

Intellectual Merit Criterion

Overall Assessment of Intellectual Merit

Excellent

Explanation to Applicant

The applicant has gained extensive research experience from the undergraduate research. It is very impressive that the applicant has 6 co-authored papers (including 5 published and one recently submitted). The applicant has also 4 conference poster/oral presentations, of which 2 won the first places. In addition, the applicant has several awards and honors and high GPA. All these achievements are the demonstration of the applicant's high academic performance. The research proposal is focused on enhancing electron mobility and mechanics in optoelectronic devices via conjugated blends is interesting and clear, addressing the limitation of conductivity of materials due to the interruption of electron mobility. The research plan would be strengthened if the proposed work can be supported by some prelim work.

Broader Impacts Criterion

Overall Assessment of Broader Impacts

Very Good

Explanation to Applicant

The proposed project has the potential to advance the technology for development of conductive materials. The applicant has engaged in the activities promoting the participation of minority/underrepresented groups and diversity and inclusion initiatives. He also has mentoring experience in providing guidance to freshman and sophomore undergraduates who are interested in polymer science. The applicant is highly motivated to pursue graduate study and further career in academia. However, the proposal lacks discussions on the educational and outreach activities for broader impact.

Summary Comments

The applicant has the great potential to contribute to STEM research and education. The proposal would be improved by incorporating educational and outreach activities.