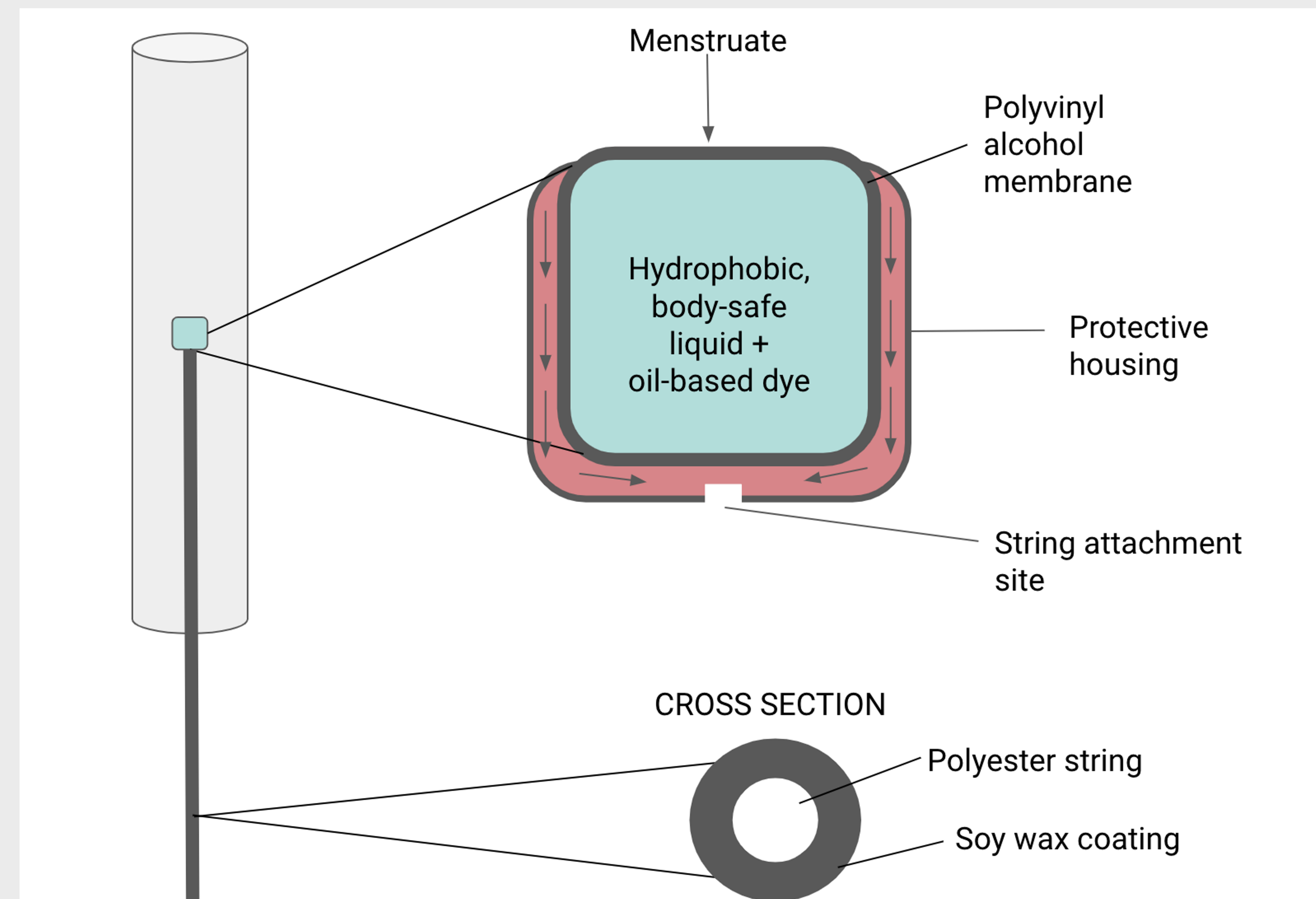


OPPORTUNITY

The current tampon has been on the market since 1931, and little to no innovation has been done to tampon design or function since it was put on the market almost 100 years ago. Menstruation also affects a large percentage of the world's population, with 50% of the female population being of reproductive and menstruating age. Not to mention, current tampons on the market come with a large environmental burden, as 7 billion tampons end up in the landfill each year. The tampon market was valued at \$4.7 billion in 2021, showing that this is a huge market and a great need for society. Despite the fact that menstruation is a part of the daily life of such a large percentage of the world's population, current products on the market fall short in addressing the realities of menstruation.



CITty Tampon: Capacity-Indicating Tampon



FINAL PROTOTYPE

- Each unit consists of a 100% cotton tampon containing a dye packet filled with a body-safe fluid and a tampon string with a soy wax coating.
- The dye packet will be a cuboid, made of polyvinyl alcohol, filled with 0.7 mL of a hydrophobic and body-safe liquid.
- The tampon string will be 100% polyester and coated in body-safe soy wax.

FUTURE WORK

- Formulate a dye with similar properties as grapeseed oil (e.g., viscosity, density, and hydrophobicity) and is safe for vaginal health. A possible solution is to use a low viscosity silicone oil.
- Implement a protective housing around the dye packet to direct the flow of dye to the string and prevent wicking into the tampon base.
- Investigate a flexible string coating material that is durable against handling and temperature and prevents the transfer of dye.
- Determine a polyvinyl alcohol composition that is flexible for easier dye packet construction and shorter dissolution time.

DISCUSSION

- Dye packet membrane dissolved in water in 2 minutes and maintained its integrity when stored in an oil.
- Oil-based dye wicked 13 cm along a 100% polyester string in 3 minutes.
- Soy wax effectively prevented dye leakage from the string while not hindering fluid flow.
- Menstruate reached the dye packet within 68 minutes.
- All capacity-sensing mechanisms will occur before the tampon capacity is reached and any leakage would occur.



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