

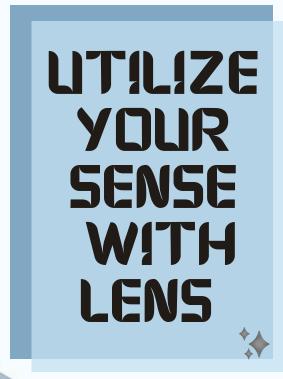
#### VIVEKANANDHA MEDICAL CARE HOSPITAL



**ALLIED HEALTH SCIENCES** 



THE STUDENT MAGAZINE



This month 's edition handpicked by

Vision squad
Bsc Optometry students





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## **SMART CONTACT LENS**

#### INTRODUCTION

Smart contact lenses are advanced, wearable devices that combine the function of traditional contact lenses with integrated microelectronics like sensors and tiny displays. They go beyond simple vision correction to offer capabilities such as real-time health monitoring (e.g., glucose and intraocular pressure), augmented reality (AR) displays, and even drug delivery for certain eye conditions.

# JOURNEY THROUGH SMART CONTACT LENS HISTORY

EARLY 2K

2003

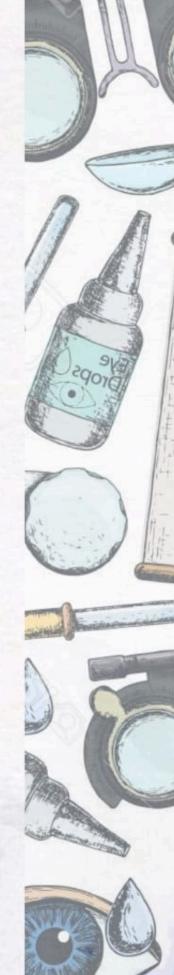
It was a Glucose sensor which finds tear glucose level

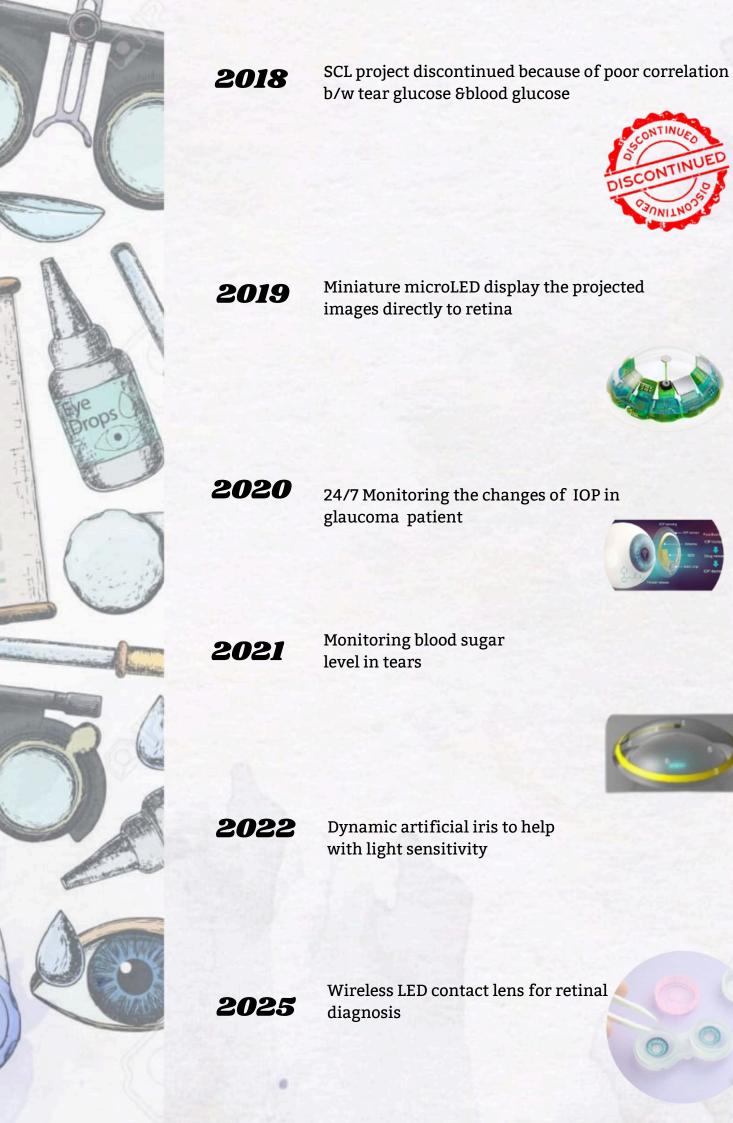


2014

Measuring glucose level in tears using wireless chip and glucose sensor







## COMPONENTS OF CONTACT LENS

#### SENSOR:

 Micro-sensors are embedded in the lens material to detect physiological signals from tear fluid, such as glucose levels or pressure changes.



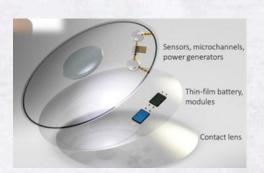
#### POWER SOURCE:

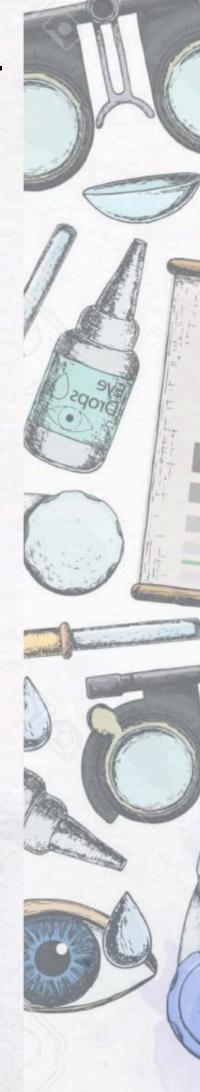
 These lenses rely on either microbatteries or energyharvesting devices that convert kinetic motion from blinking



#### **ELECTRONIC AND MICROPROCESSOR:**

 Tiny processing units are included to interpret sensor data and control the lens's functions.







#### WIRELESS COMMUNICATION:

 Miniature antenna enables data transmission to an external device like a smartphone or tablet, allowing for remote control and monitoring.



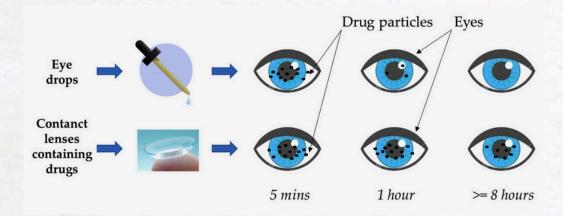
## APPLICATION

### Medical monitoring

Smart contact lenses offer advanced medical monitoring by noninvasively tracking physiological signals like glucose levels,
intraocular pressure (IOP), and other biomarkers in tears.
Integrated biosensors and microelectronics within the lens
capture data, which is then wirelessly transmitted to a mobile app
for real-time analysis, empowering users and doctors to manage
conditions such as diabetes and glaucoma.

## Drug delivery

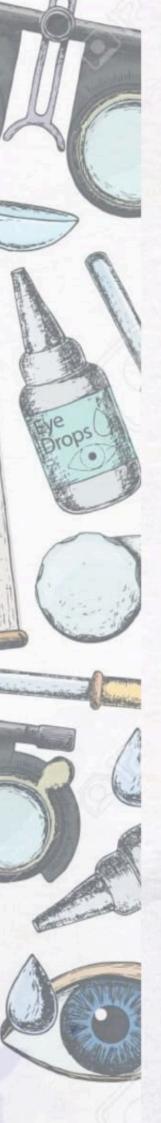
 SCLs can deliver various medications, like antibiotics, antiinflammatories, and glaucoma treatments, improving patient compliance and reducing systemic side effects.



### AR and vision booster

 AR and vision booster involves micro displays that project digital content onto the retina, creating an overlay of virtual information and experiences onto the wearer's real-world view, as well as integrated sensors for real-time health monitoring and vision correction.





## **Industry Pioneers**



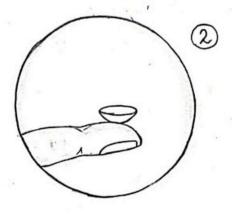
• Vision is developing a smart contact lens with an integrated microLED display, micro-sensors, and wireless communication for augmented reality (AR) and vision assistance. The technology aims to overlay digital information, such as text and graphics, directly in the user's field of vision while allowing for control through eye movements. While the project has faced challenges and the company has pivoted to focus on its microLED technology, the goal was to create an "invisible computing" experience for various applications like fitness tracking, navigation, and health monitoring



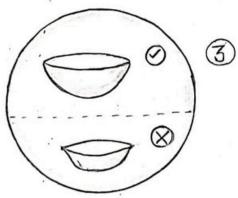
## INSERTION OF CONTACT LENS



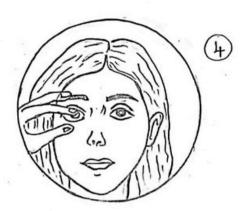
Wash your hands throughly with water and soap. Dry with alint free towl



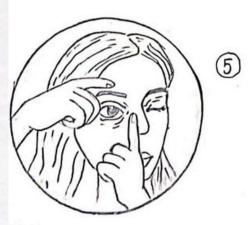
Place the lens on the tip of your finger



Check that the lens is not inside out it should be shaped like a bowl



Look straight ahead

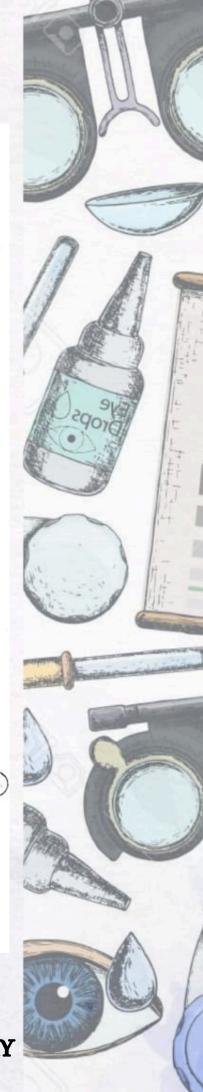


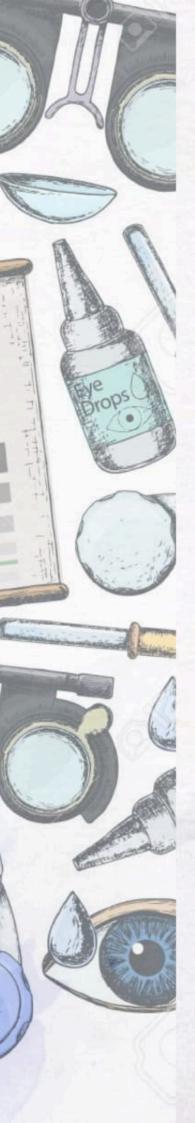
Insert lens and stay still



blink

A. Nithya
III- BSC OPTOMETRY





## THE TACO TEST

#### How to tell if your contacts are inside out



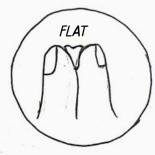
Your contact should look like a bowl that comes straight up



If your contact lens is inside out It will flare out like a saucer



Hold the contact gently between your two finger. It should make a Taco



If you try to make a Taco , but it flattens onto your finger, it is inside out

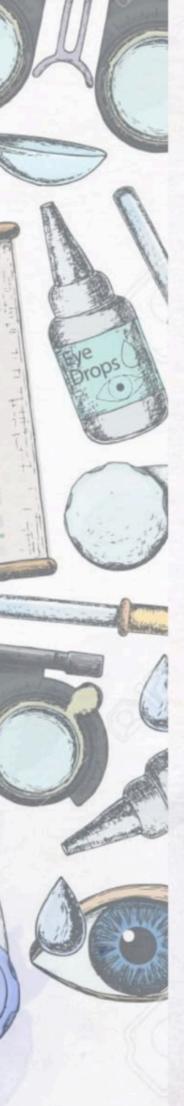
S. UMA III - BSC OPTOMETRY

# Poem

my eyes my eyes
how you had more problem \_ like
glaucoma; dry eye; blured vision ...
oh my eyes!! oh my eyes !!
I am so tried to visit the hospital...
oh my eyes oh my eyes \_ now
I am so happy; so happy
I find a way insted of going hospital ...
oh my eyes oh my eyes
can you guess
I buy a smart contact lens ...
I watch your condition in my smart phone ...
oh my eyes oh my eyes

V.JAYASRI III BSC OPTOMETRY





# Slogan

the world is so beautiful with the combination of nature and technology.....
we feel the beauty of the world through our eyes ...
so we had responsible to protect it .. protection is come from the monitoring

smart contact lens is best for monitoring.....
so we monitor; protect; and see the world through it...

P.NANDHINI
IIIBSC OPTOMETRY

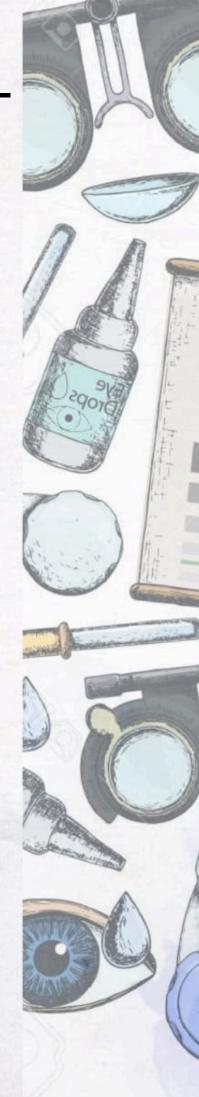
## DO'S & DONT'S OF CONTACT LENS

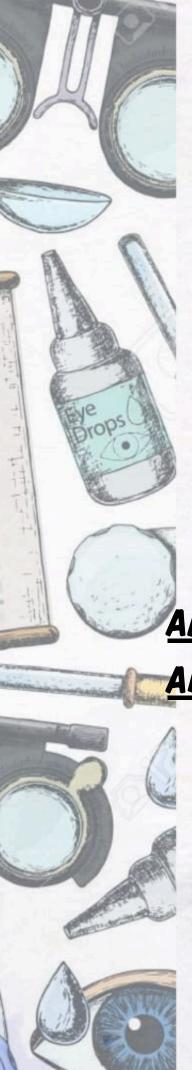
### Do's

- Discard daily disposable lenses after each wear
- Always wash and dry your hands prior to handling your lenses
- Have regular check ups
- Ensure you have an up to date pair of glasses
- Check the lens is the right way round before wearing it

### Don'ts

- Don't use contact lens when your get infected and irritated
- Don't get sleep and showering with contact lens on
- Don't reuse the solution which the contact lens soaked
- Don't use any eye drops with contact lens on
- Don't use tap water for cleaning the contact lens





## <u>ADVANTAGE</u>

- · Advanced technology for health monitoring
  - · Standard vision correction
  - It enhance best vision
- Early disease detection
- · Glaucoma management
- Diabetic management
- · Management of dry eye syndrome
  - · Post operative care
- · Continuous health monitoring

# ADVANTAGE FOR ENHANCED VISION AND DAILY LIFE

- 1. Vision enhancement
- 2. Natural interaction
- 3. Enhanced visual acuity

## CHALLENGE

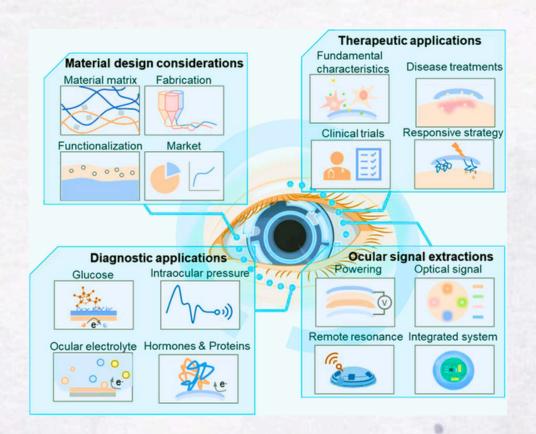
- Hard to create a safe and reliable power source.
- It has ethical issues including data privacy.
- · Traditional batteries are too bulky.
- Energy harvesting from tears or body heat does not generate sufficient power for continuous use.

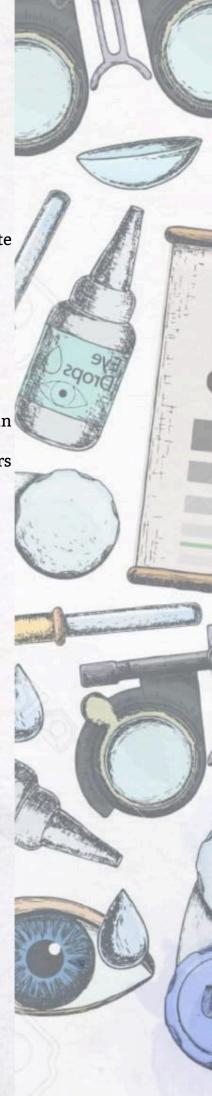
## FUTURE PROSPECTS

Smart contact lenses (SCLs) offer revolutionary future prospects in medicine and technology, acting as advanced wearable biosensors for continuous

#### **Disease monitoring**

#### Targeted treatment







## REFERENCE

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# **WORKSHOP**













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