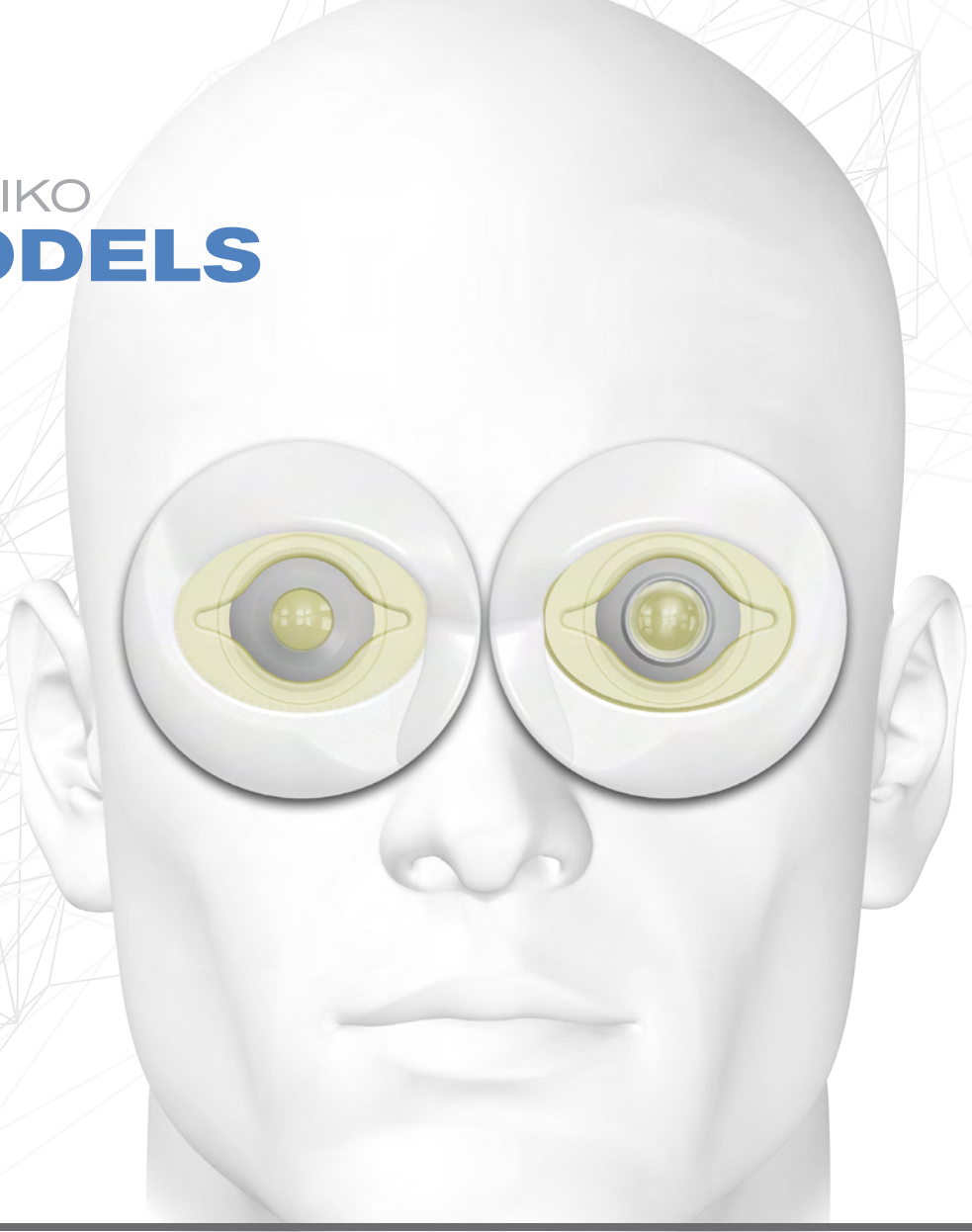
BIONIKO
MODELS



OPHTHALMIC
SURGICAL MODELS

BIONIKO designs innovative surgical models, task trainers and teaching tools for the ophthalmic industry.

Our surgical models present the user with dexterity and coordination challenges of common surgical scenarios, allowing fundamental skills to be practiced using real surgical instruments. The models aim to replicate consistency, proportions and continuous interfaces between different ocular sub-structures, providing high fidelity tissue simulators that can be cut, dissected and sutured.

Surgical models allow faculty to demonstrate surgical technique. Users gain proficiency and perfect surgical skills in a safe, realistic, and non-stressful environment. Furthermore, synthetic models enable repeatable and standardized assessment of surgical technique.

Our surgical models can be easily incorporated into any training program to help develop and perfect:
Spatial Perception: Surgical approach, orientation, depth and scale
Motor Skills: Instrument control, muscle memory and hand-eye coordination
Technical Understanding: Instrumentation, surgical sequence and best practices

FEATURES AND BENEFITS

AVAILABLE

Training on demand for individual pace and needs

PORTABLE

Teach in the classroom, train in the OR and practice at home

REPEATABLE

Standardize training and assessment without model variability

AFFORDABLE

Surgical simulation tools at textbook cost

SIMPLE

Ready to use with minimum setup and assembly

SYNTHETIC

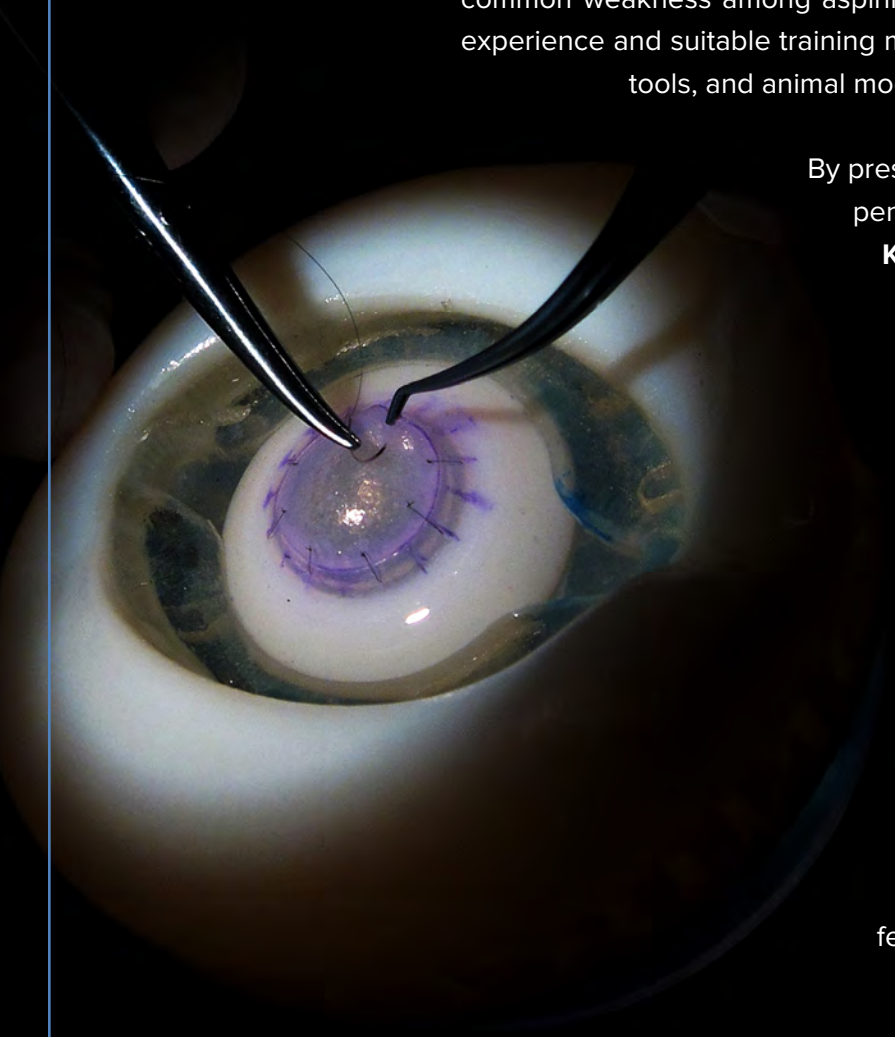
No refrigeration or special disposal required

KERATO

Suturing Task

BIONIKO MODELS

Suturing is a fundamental skill in ophthalmic surgery. However, it is a common weakness among aspiring surgeons due to the lack of operative experience and suitable training models. This skill is absent in virtual reality tools, and animal models are not accurate or repeatable.



By presenting the main challenges of a penetrating keratoplasty (PKP) scenario, the **KERATO** task allows users to learn, train and perfect the skills required to perform precise suturing under a microscope.

The **KERATO** task consists in suturing a corneal graft to a host limbus using real surgical instruments. The user will need to properly handle forceps, needle holder, scissors and 10-0 suture to complete the task.

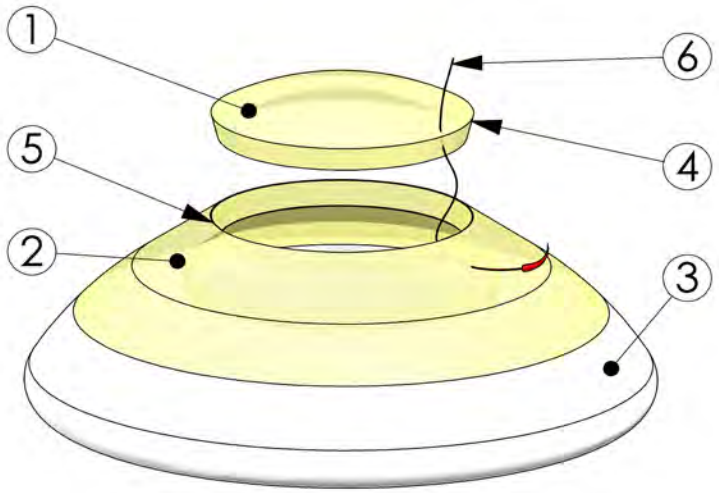
With practice the user will gain confidence, reduce time to completion, improve suture radiality and spacing, maintain even and safe distance to tissue edge and gain better feel for suture tension during knot creation.

Pat. Pending

BIONIKO
MODELS

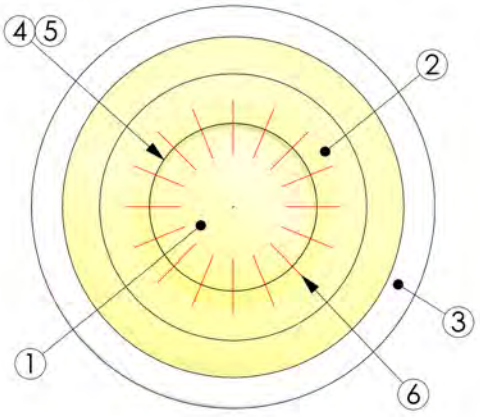
KERATO

1 - CORNEA
2 - LIMBUS
3 - SCLERA
4 - GRAFT EDGE
5 - RECIPIENT EDGE
6 - SUTURE



FEATURES AND BENEFITS

- Accurate tissue proportions
- Realistic tissue feel
- Repeatable and available
- Encourages awareness of tissue hydration
- Practice microsuturing techniques (continous/interrupted)
- Improve confidence and decrease fatigue
- Improve time to completion (Decrease OR time)
- Self asses execution by checking for:
  - Suture radiality
  - Safe and even distance to tissue edge
  - Knot tension
  - Even spacing between sutures

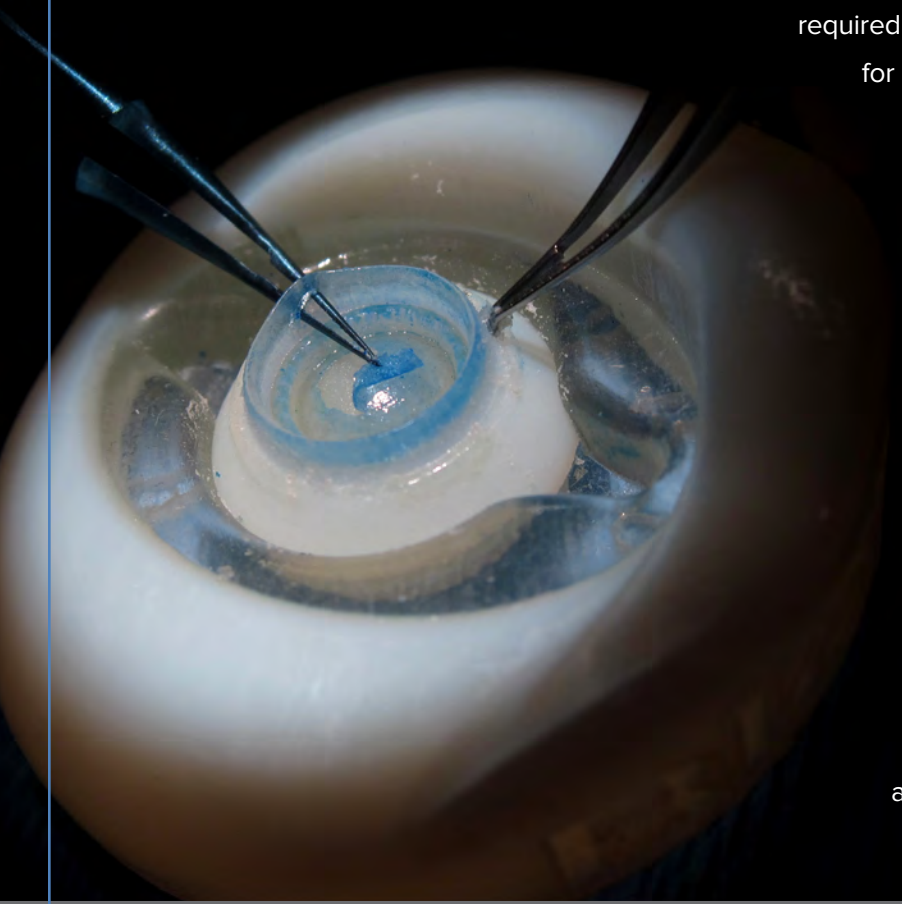


RHEXIS

Instrument Control Task

BIONIKO MODELS

Instrument control through ports is a fundamental skill in ophthalmic surgery. However, it is a common weakness among aspiring surgeons due to the lack of operative experience and suitable feedback from available models.
By presenting the main challenges of a capsulorhexis scenario, the **RHEXIS** task allows users to learn, train and perfect the fine motor skills required to properly use the wound as a fulcrum point for instrument movement.



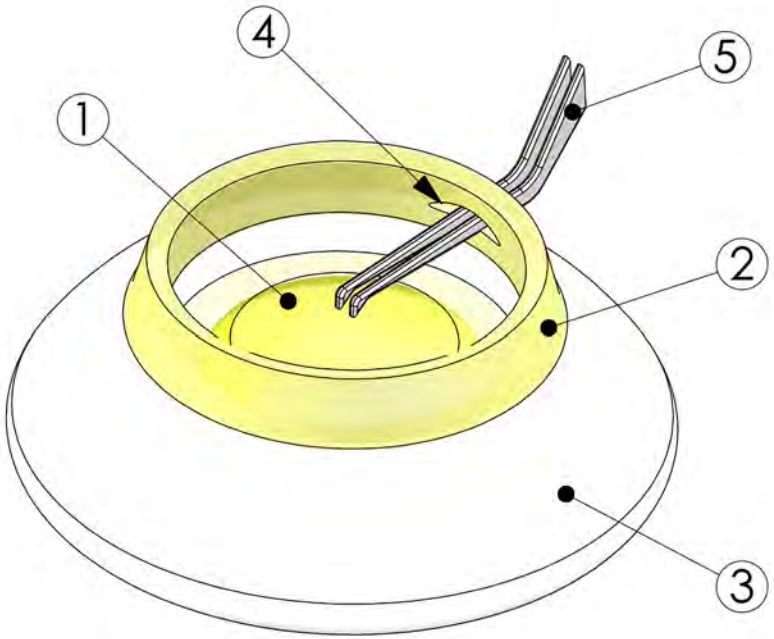
The task consists in performing a capsulorhexis by manipulating instruments through an incision on a delicate limbus rim. Improper instrument control will cause stress and damage to the limbus, providing feedback to the user. In addition to a proper capsulorhexis, minimizing damage to the limbus rim is key to complete the task succesfully.
With practice the user will increase confidence, reduce time to completion, improve rhexis shape, size and centration, and minimize stress on the wound.

Pat. Pending

BIONIKO
MODELS

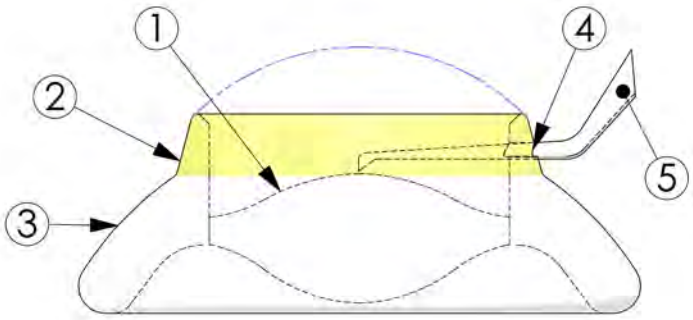
RHEXIS

1 - LENS CAPSULE
2 - LIMBUS RIDGE
3 - SCLERA
4 - WOUND
5 - INSTRUMENT



FEATURES AND BENEFITS

- Repeatable and available
- Limbus ridge designed to provide instrument handling feedback
- Encourages good practices:
  - posterior incisions
  - regrasping
  - wound awareness
- Improve surgical skills confidence
- Develop instrument control
- Decrease reliance on donor tissue for training
- Decrease wound size
- Improve time to completion
- Asses instrument control by checking wound integrity
- Assess execution by measuring rhexis size and centration



ORBIT
Model

BIONIKO MODELS

The **ORBIT** is the holder for all BIONIKO anterior segment models. It provides an anatomical frame of reference and adds realism to the surgical scenario by challenging the user to manipulate instruments according to the facial structures around the eye.

The **ORBIT** can be secured to any smooth surface (horizontal or vertical) with its integrated suction cup and will still retain a realistic degree of freedom that simulates head and eye movement.

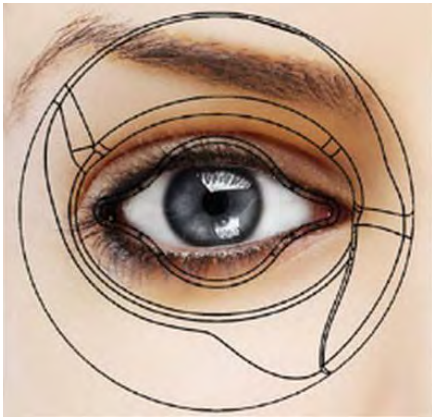
There are right and left **ORBIT** models to practice all approaches: Right-Superior, Right-Temporal, Left-Superior and Left-Temporal

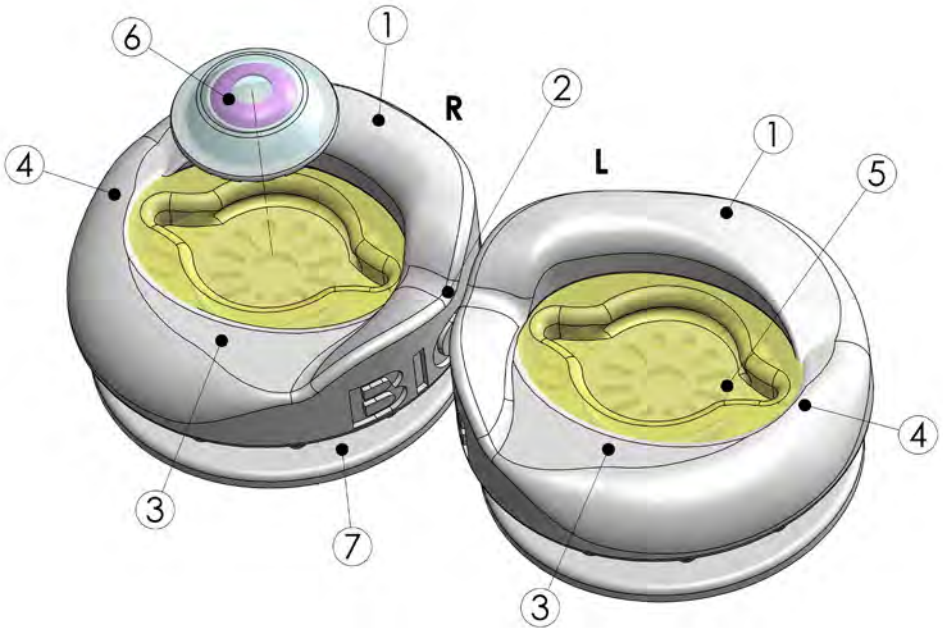
Pat. Pending

BIONIKO
MODELS

ORBIT

1 - BROW / SUPERIOR
2 - BRIDGE / NASAL
3 - ZYGOMATIC / INFERIOR
4 - TEMPORAL
5 - EYELID / SOCKET
6 - EYE MODEL
7 - SUCTION CUP





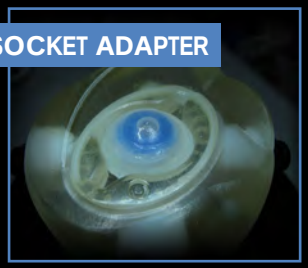
FEATURES AND BENEFITS

- Provides anatomical frame of reference to anterior segment models
- Practice superior (1) or temporal (4) approaches on both left (L) and right (R) eyes
- Suction-cup firmly attaches to any smooth surface while retaining realistic movement
- Compact and portable design

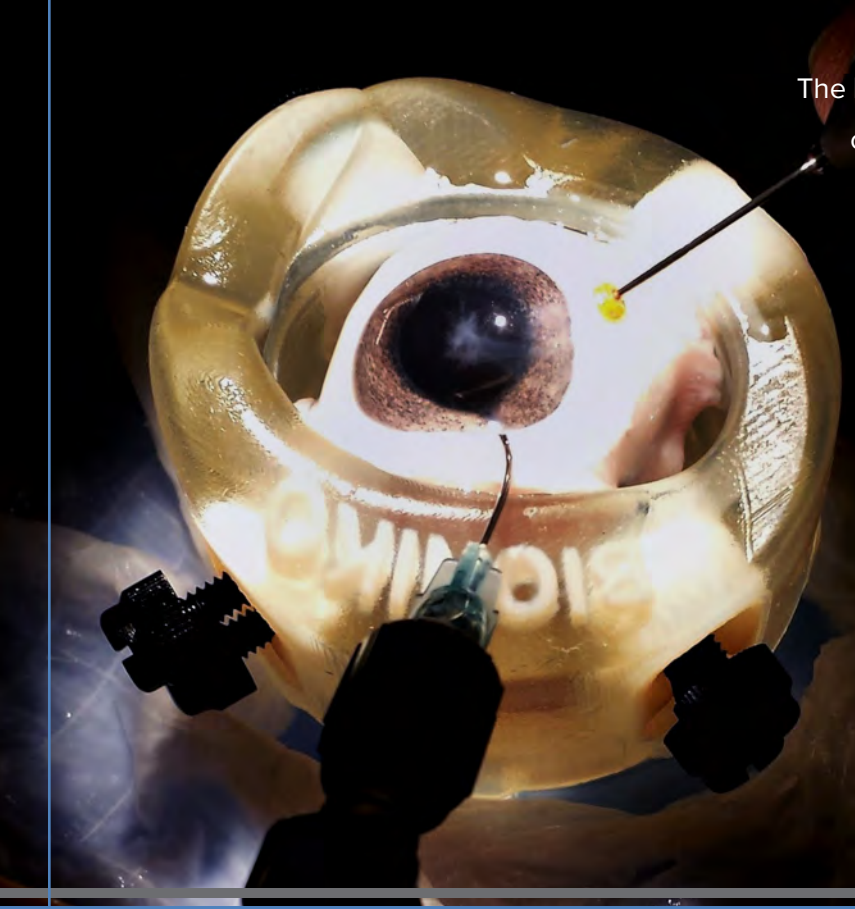
FLEX-ORBIT

Modular Training Platform

BIONIKO MODELS



The **FLEX-ORBIT** modular training platform enhances and facilitates the use of ex-vivo and synthetic eye models for training and R&D purposes. It can position, secure and pressurize ex-vivo eyes of different sizes (18-26mm Ø), while providing the user with an anatomical frame of reference.



The **FLEX-ORBIT** is designed to receive and complement the entire line of BIONIKO synthetic models. Whole globe models like **OJOS and EXOS** fit right in. With the included socket adapter, the **FLEX-ORBIT** can receive all anterior segment models and task trainers, such as the **RHEXIS** and **KERATO**. This makes the **FLEX-ORBIT** a versatile tool for any surgical training program.

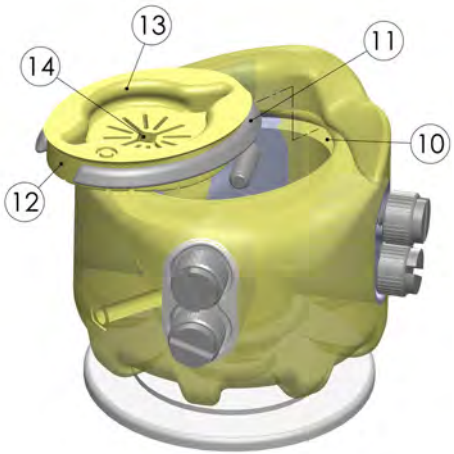
This compact platform is ideal for use in the classroom, research lab, wet-lab and even at the office to communicate with colleagues and patients.

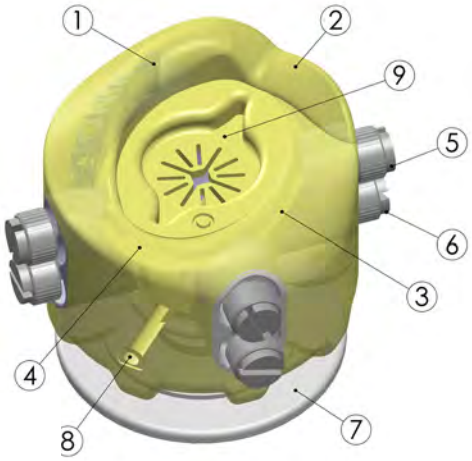
Pat. Pending

BIONIKO
MODELS

FLEX-ORBIT

1 - SUPERIOR (BROW)
2 - NASAL (BRIDGE)
3 - INFERIOR
4 - TEMPORAL
5 - ANTERIOR SCREW
6 - POSTERIOR SCREW
7 - SUCTION CUP
8 - DRAIN/PORT
9 - SOCKET ADAPTER
10 - ADAPTER GROOVE
11 - SNAP RING
12 - SNAP RING GAP
13 - EYELID
14 - SOCKET BASE





FEATURES AND BENEFITS

- Use with both synthetic and biological tissue models*
- Adjust eye position with posterior screws (6)
- Adjust intra-ocular pressure with anterior screws (5)
- Suction-cup firmly attaches to any smooth surface
- Socket adapter for anterior segment models

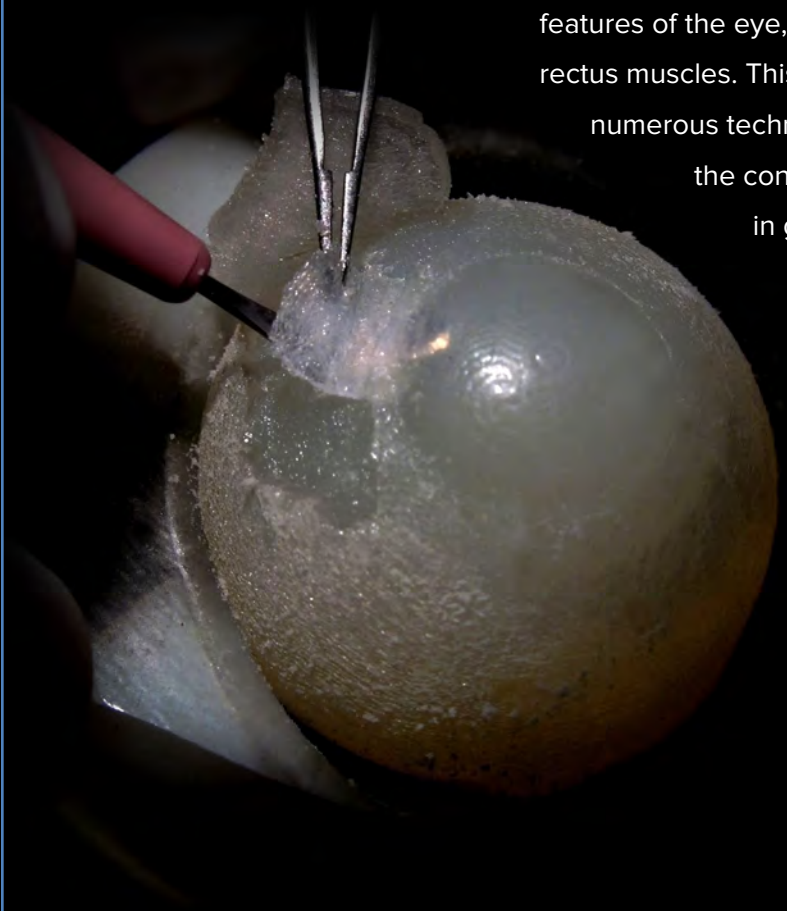
* For research use only

OJOS

Model Eyes

BIONIKO MODELS

The **OJOS** Extraocular model simulates the external anatomical features of the eye, including conjunctiva, sclera, cornea and rectus muscles. This model allows demonstration and practice of numerous techniques requiring dissection and manipulation of the conjunctiva and sclera. Procedures encountered in glaucoma surgery, such as shunt implants and trabeculectomies, can be demonstrated and practiced on the model. The **OJOS** model can be used in conjunction with the **FLEX-ORBIT** platform for added challenge and realism.

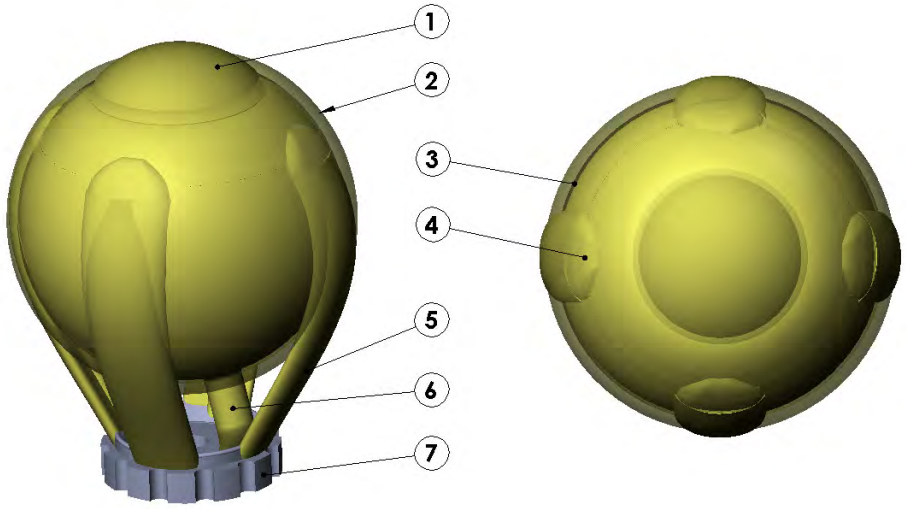


Pat. Pending

BIONIKO
MODELS

OJOS

1 - CORNEA
2 - CONJUNTIVA
3 - SCLERA
4 - MUSCLE INSERTION
5 - RECTUS MUSCLE
6 - OPTIC NERVE
7 - BASE



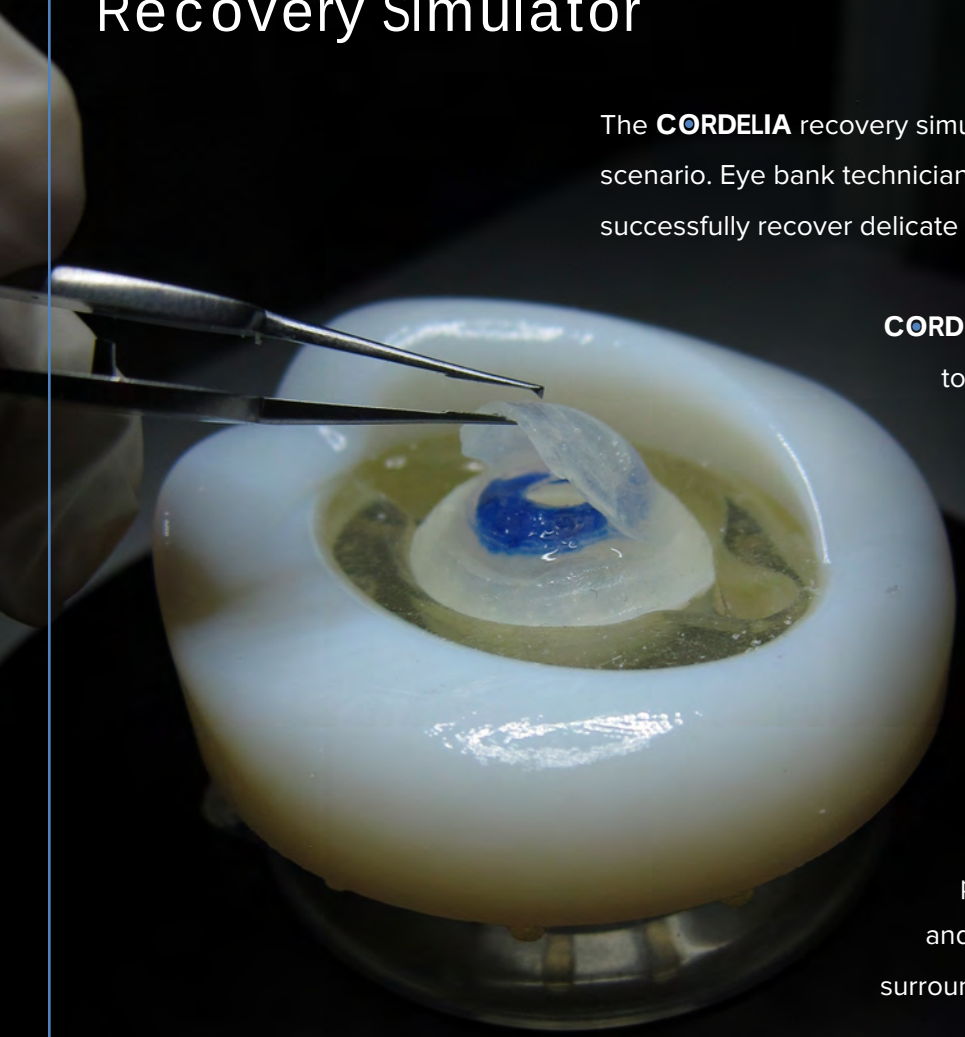
FEATURES AND BENEFITS

- “Loose” and continuous conjunctiva/tenon’s layer for realistic dissections
- Standardize your instruction and assessment around a consistent model
- Long shelf life
- No refrigeration needed
- No biohazard handling or disposal required
- Available on demand
- Decrease reliance on donor/animal tissue for training

CORDELIA

Recovery Simulator

BIONIKO MODELS



The **CORDELIA** recovery simulator is based on an in-situ excision scenario. Eye bank technicians must master this technique to successfully recover delicate corneal tissue from donors in the field.

CORDELIA is a task trainer that allows users to learn and practice the tissue recovery technique without using valuable donor tissue, in a realistic yet simple manner. Its repeatability and availability makes it ideal for developing standardized methods of instruction and assessment.

The **ORBIT** (Sold separately) serves a holder for the **CORDELIA** models and provides support, frame of reference and the challenges posed by facial features surrounding the eye.

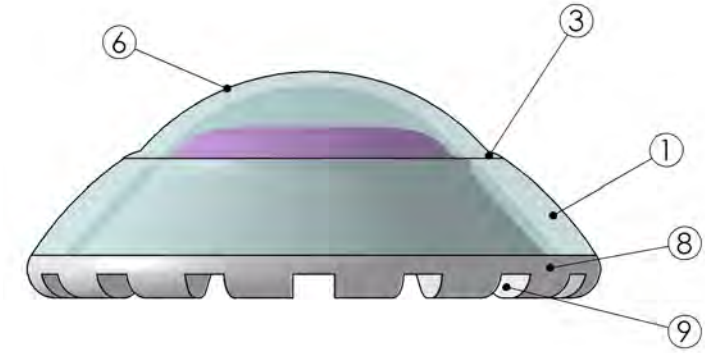
The CORDELIA recovery model was made possible by the valuable guidance and support of LIONS Vision Gift

LIONS VISION GIFT

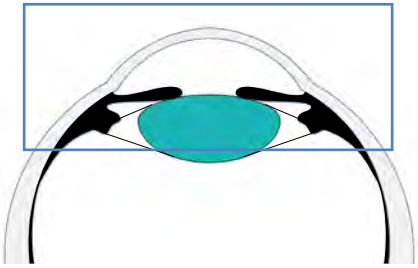
BIONIKO
MODELS

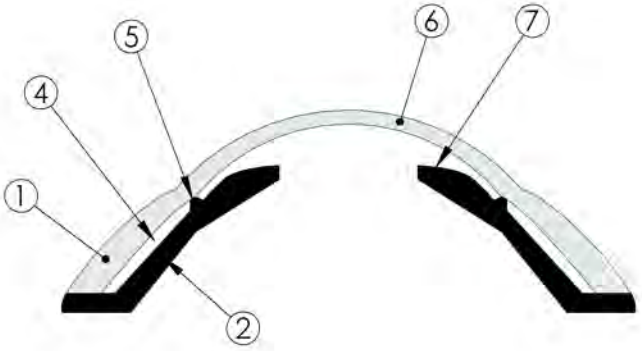
CORDELIA

1 - SCLERAL LAYER
2 - CHOROID LAYER
3 - LIMBUS
4 - SUPRA-CHOROIDAL SPACE
5 - SPUR
6 - CORNEA
7 - IRIS
8 - STRUCTURAL RING
9 - NOTCH



DETAIL VIEW





FEATURES AND BENEFITS

- Practice corneal detachment technique
- Refine sequence and manipulation of surgical instruments
- Decrease reliance on donor tissue for training
- Available on demand
- Standardize your instruction and assessment around a consistent model

EXOS

Enucleation Simulator

BIONIKO MODELS

The **EXOS** model focuses on simulating the challenging steps of an enucleation and corneal excision procedures. Learning to hook and transect the muscles and optic nerve is a fundamental skill for eye-bank technicians. The **EXOS** is coupled to our **CORDELIA** recovery simulator, allowing the practice of corneal excision with greater realism.

Users can demonstrate and practice the sequence and manipulation of surgical instruments around anatomical landmarks. The **EXOS** model serves as a tool for introductory instruction and competency reviews.

The **FLEX-ORBIT** (Sold separately) serves as a holder for the **EXOS** model and provides reference and realism by challenging the user to manipulate instruments according to the orbit cavity and facial structures around the eye.

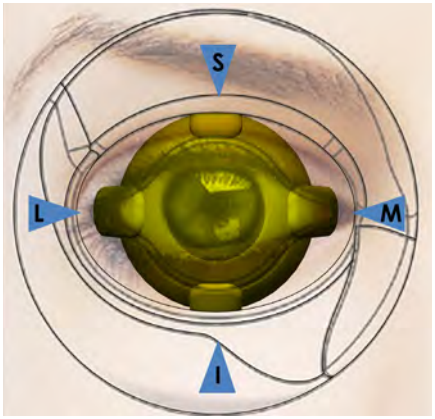
The EXOS Enucleation Simulator was made possible by the valuable guidance and support of Florida Lions Eye Bank

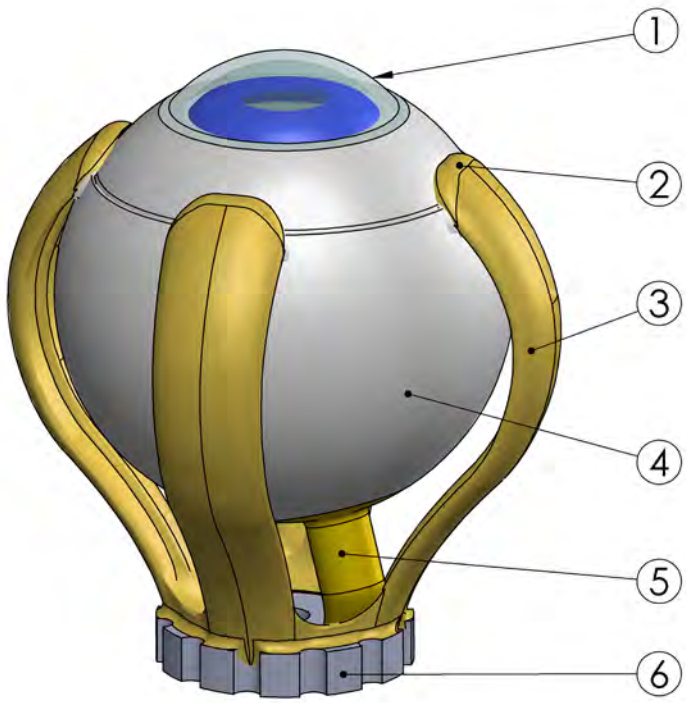
FLORIDA LIONS EYE BANK

BIONIKO
MODELS

EXOS

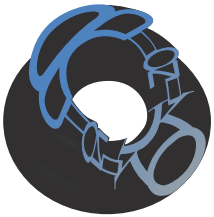
1 - CORDELIA MODEL
2 - MUSCLE INSERTION
3 - RECTUS MUSCLE
4 - GLOBE
5 - OPTIC NERVE
6 - BASE





FEATURES AND BENEFITS

- Realistic muscle traction and feel
- Practice enucleation and excision in one model
- Practice sequence and manipulation of surgical instruments
- Decrease reliance on donor tissue for training
- Available on demand
- Standardize your instruction and assessment around a consistent model



BIONIKO
MODELS

www.bioniko.com
Phone: (507) BIONIKO
Email: info@bioniko.com
www.youtube.com/user/BionikoDesign