COLLIN

Dedicated to ENT

1820 - 2020 Bicentenary

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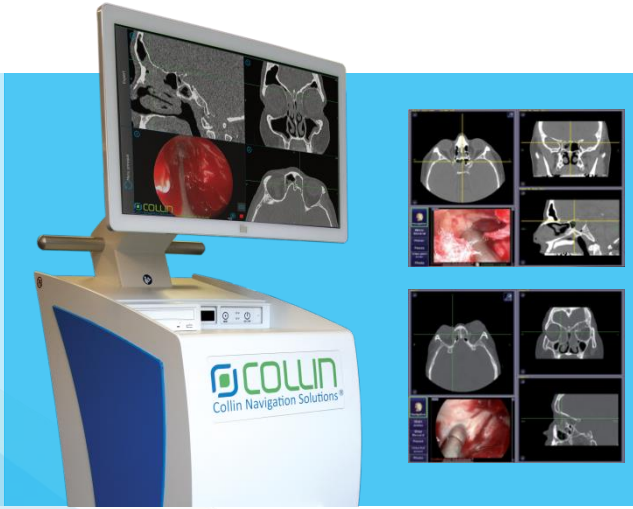
A strong identity in ENT

SINCE 1820

ENT technologies: surgery and diagnosis

- Computer-guided image in ENT
- Otology
  Audiology
  Rhinology
  Laryngology
- ENT equipment and instruments
- Disposable devices
- **Innovation**

Collin products



▶ Collin Navigation Solutions®

→ Surgical navigation system

▶ RobOtol®

→ Only one RobOtic system in the world dedicated to ear surgery

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Partners

Inserm
La science pour la santé
From science to health

ASSISTANCE PUBLIQUE HÔPITAUX DE PARIS

HÔPITAUX UNIVERSITAIRES
PITIÉ SALPÊTRIÈRE
CHARLES FOIX

Institut Pasteur

INVESTIR L'AVENIR

FONDATION POUR L'AUDITION
À L'ÉCOUTE DE LA VIE

medicen

ROBOTOL®

Robotic system dedicated to ear surgery

Research work begun in 2005

- **In partnership with:**

  APHP - Team of Pr. Olivier Sterkers and Pr. Yann Nguyen
  Inserm

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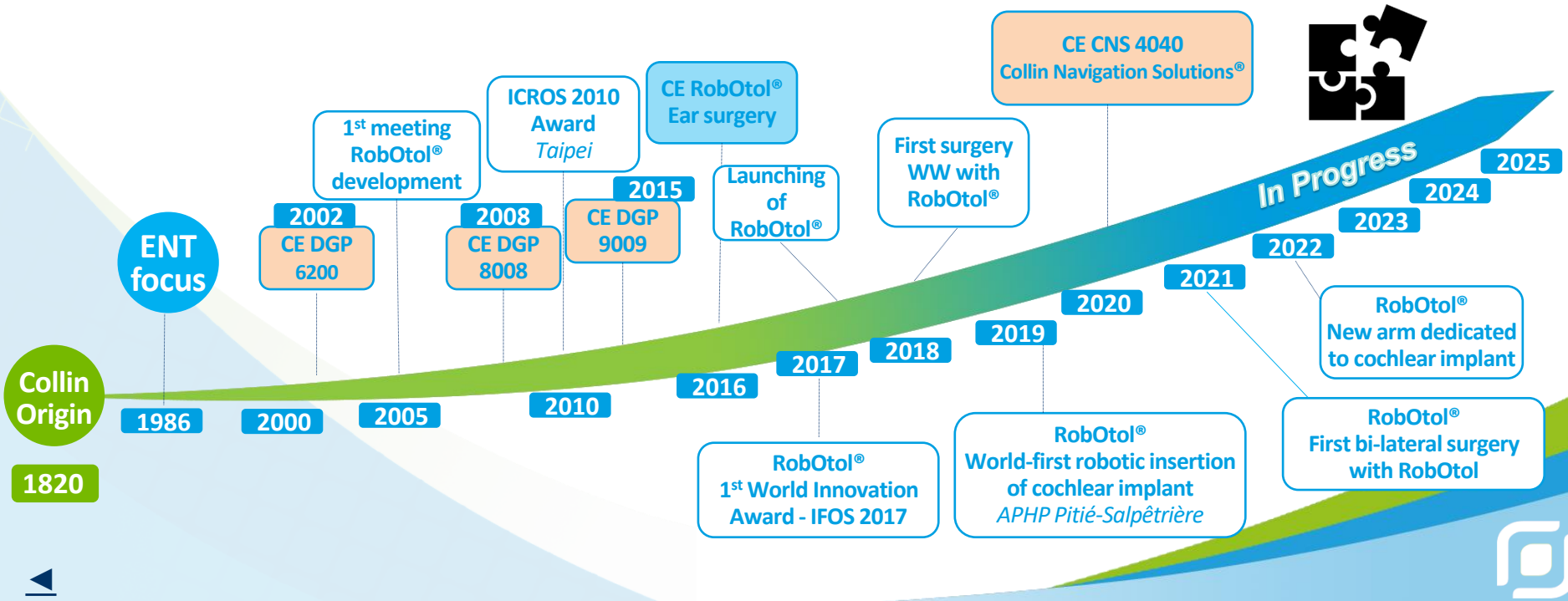
Timeline : 40 years of ENT expertise



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ROBOTOL®

2010

2010 IEEE/RSJ International Conference on Intelligent Robots and Systems
October 18-22, 2010, Taipei International Convention Center, Taipei, Taiwan

ICROS Best Application Paper Award

RobOtol : From Design to Evaluation of a Robot for the Middle Ear Surgery

Mathieu Miroir, Yann Nguyen (Université Paris 7 Denis Didero),
Jérôme Szewczyk (Université Paris 6 P. et M. Curie), Stéphane Mazalaigue (Collin Inc.),
Evelyne Ferrary, Olivier Sterkers, Alexis Bozorg Grayeli (Université Paris 7 Denis Didero)

ICROS
Institute of Control, Robotics and Systems

October 20, 2010

Man H. Lee

Man Hyung Lee, Ph.D.
President of ICROS

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ROBOTOL®

Tele-operating Robotic System to assist the mini-invasive ear surgery


Innovation form the Industry Award

this certificate is awarded to

Dr. Yann NGUYEN (UPPIC, MASER, APHP) and COLLIN (FRONO)

during the ENT World Congress IFOS Paris, from June 24th to 28th 2017 held at Palais des Congrès, Paris

Bernard FRAYSSE, President
Frédéric CHABOLLE, General Secretary
Emmanuel BABIN, Scientific program chair
Dominique CHEVALIER, Fund raising committee
Jean-Marc JUVANON, Vice general secretary

Pr Profant
Pr Sterkers

- **2017: Award Innovation - IFOS**

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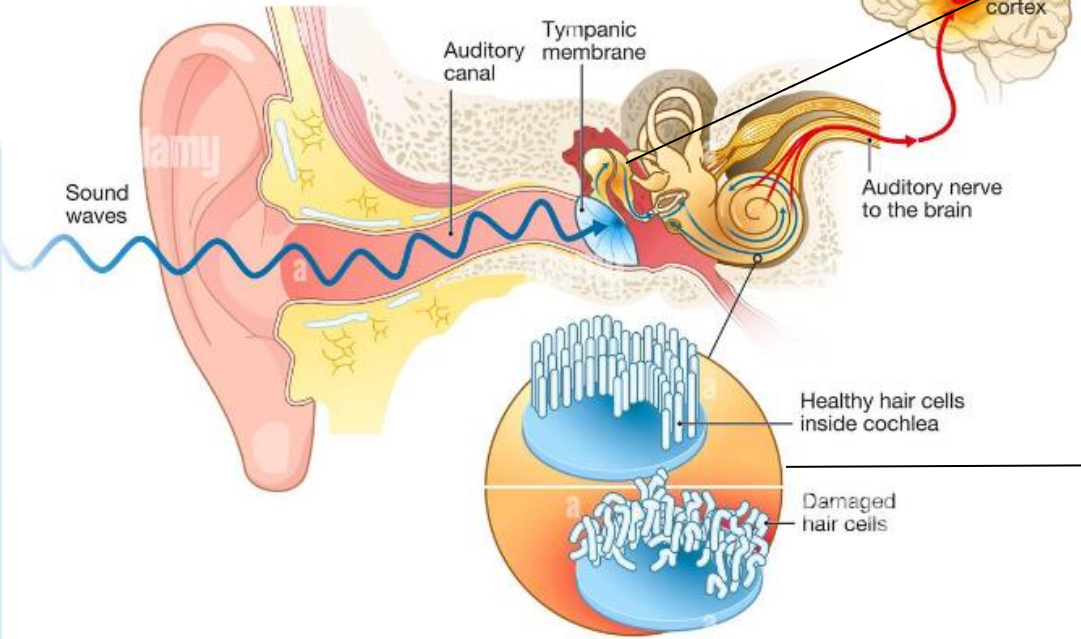
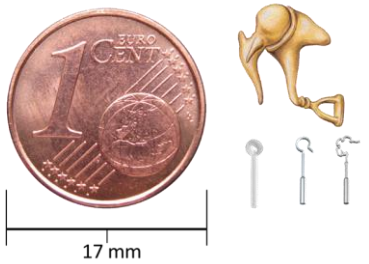
Why a robot in otology is needed?

► RobOtol®, an extremely promising tool

Patient context

- **5%** of the world's population suffers from disabling hearing loss
- **360 million**, half of which are children in 2019
- 7th cause of disability
- **10 %** of the population in 2050 (900 millions)





10 µm vs 100µm

The Hand

Sir Charles Bell « the Hand: its mecanism and Vital Endowments, as Evincing Design », 1833

+ Complex gesture

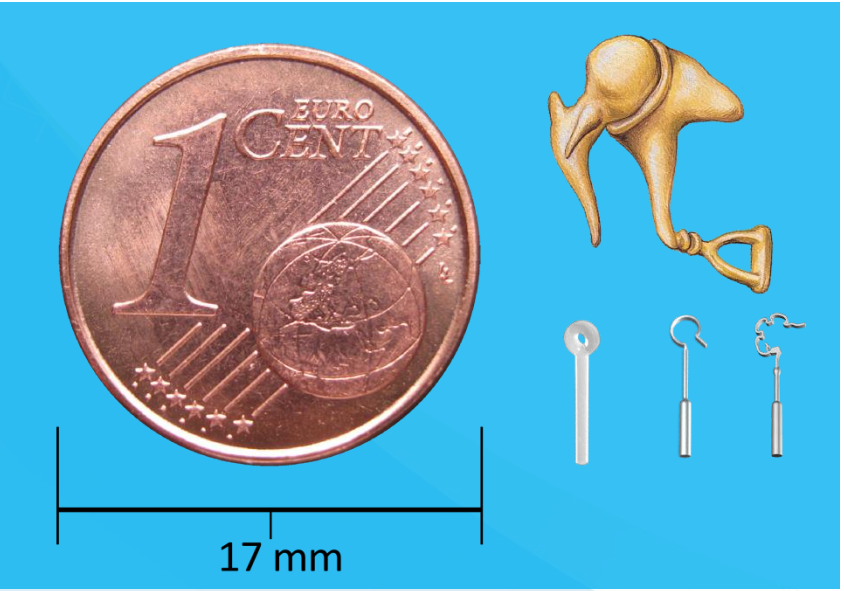
- 22 degrees of liberty (+ 6 for the arm)

+ Sensitive Feed-back!

- Accuracy limited by involuntary movements

- Tremors
- No controlled movements
- Drift

► RobOtol®, an extremely promising robot

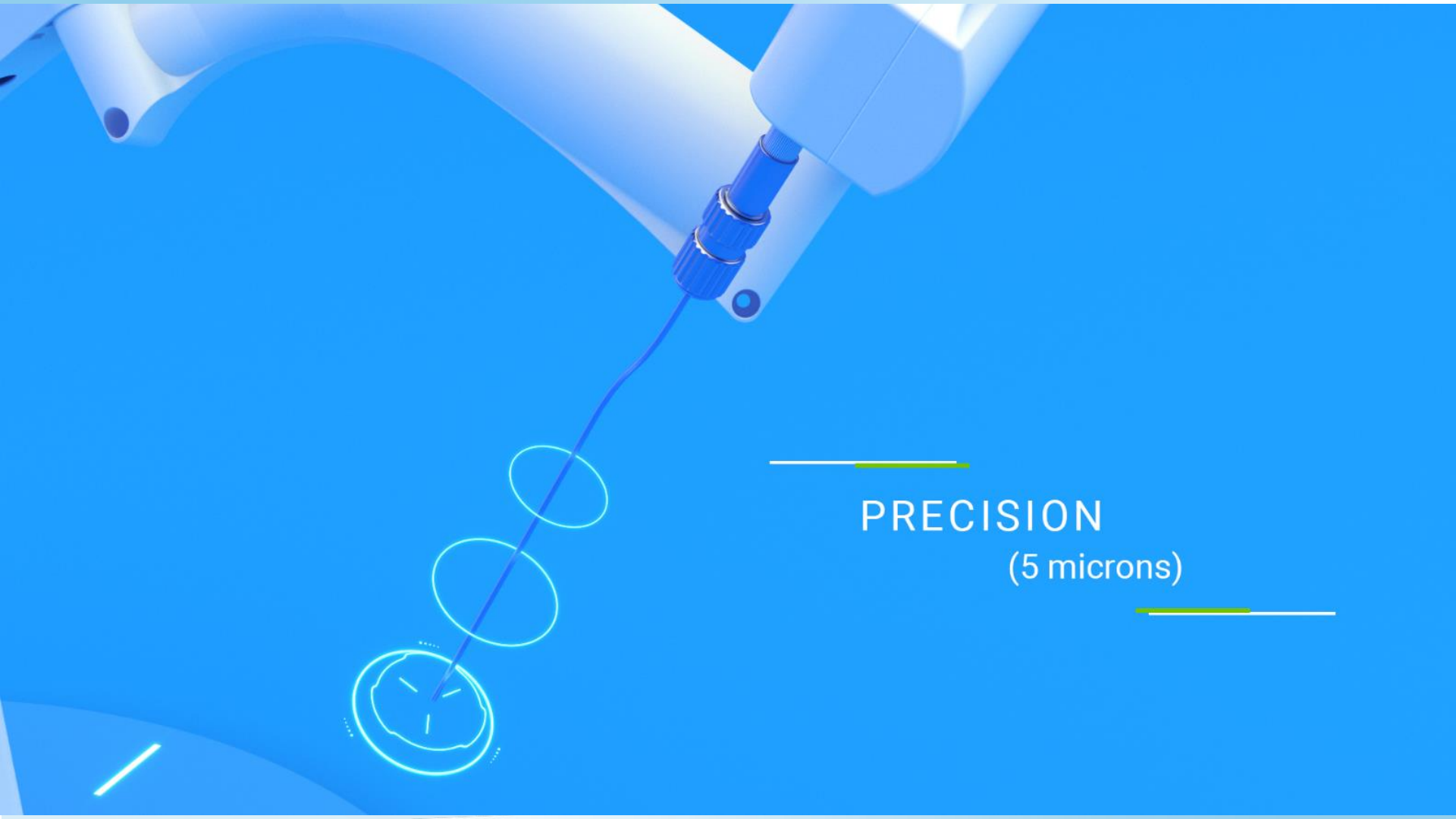


ENT surgeons context

- **Middle ear surgery**
  Otosclerosis (laser shooting, dedicated instruments),
  ATT,oto-endoscopy (Surgery with an optic)
- **Inner ear surgery**
  Placement of cochlear implants

Biomedical research context

- **Help with the insertion of therapeutic products into the cochlea**
  Therapy molecule, gene therapy, ...
  (Institut Pasteur, Institut de l'audition, Inserm Unit)


PRECISION
(5 microns)

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Configuration

ARM for passive instruments

ARM for active instruments

ARM for Optics

ARM dedicated to active instruments

- Decrease surgical variability by controlling the speed and acceleration of electrode insertion.
- Decrease the risk of additional hearing loss or vestibular symptoms
- Micrometer precision beyond human capabilities.
- Reproducibility
- Safety (Atraumatic)
- Steady
- Perfect control
- Small footprint

Control beyond human capabilities.
Without disruption to your normal surgical flow

ARM dedicated to OPTICS

- Vision and ergonomics
- Reduction of complications and recurrences
- Treatment of complex pathologies
- Safety, Precision, Stability, Reproducibility
- Two hands free
- Minimal invasive surgeries
- Rapid recovery after surgeries
- Decrease time hospitalisation
- Reduction of the learning curve for endoscopy

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Current Users

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- Lille
- Rennes
- Brest
- Paris
- Hôpital de la Pitié-Salpétrière
- Hôpital Robert Debré
- Paris
- Paris
- Nantes
- Clermont-Ferrand
- Saint-Etienne
- Montpellier
- Besançon
- Nice

- Czech Republic
- Germany
- Belgium
- Italia
- China

ROBOTOL®

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Current users

Pr Y. Nguyen
France

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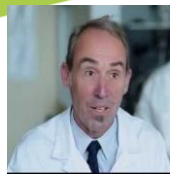


Pr P. Lefebvre
Belgium

CHU de Liège

Pr H. Wu
China

Pr F. Venail
France

CHU MONTPELLIER

Pr R. Marianowski
France

CHRU CENTRE HOSPITALIER REGIONAL UNIVERSITAIRE BREST

Pr T. Lenarz
Germany

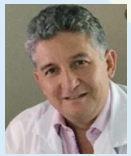
MHH Hannover Medical School

CENTRE HOSPITALIER UNIVERSITAIRE DE NANTES

Pr P. Bordure
France

Necker ENFANTS MALADES

Pr N. Loundon
France



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CHU BESANÇON

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15 RobOtol Studies

Robotic system dedicated to ear surgery

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► RobOtol®, A technological revolution for the benefit of all

► For patients

- Minimally invasive transtympanic surgery
- Gain on hearing
- Treatment of congenital deafness

► For surgeons

- Reduction of complications and recurrences
- Treatment of complex pathologies
- Safety, Precision, Stability, Reproducibility
- Vision and ergonomics
- Reduction of the learning curve

► For institutions

- Ambulatory surgeries
- Reduced of the surgical time
- Reduced costs and complications
- No hidden costs
- Attractivity (Patients/Surgeons…)

► For payers

- Reduction in the cost of the treatment path
- Reduction of the direct and indirect cost of deafness
- Promotion of healthcare structures and clinical research

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► RobOtol®, an extremely promising tool

Addition of instrumentation

- **Development of the instrumentation range with RobOtol®**
  - → Passive instruments,
  - → Active instruments (Pliers, etc.),
  - → Passive implant inserter (passive gripping),
  - → Active implant inserter (active pushing and / or forceps),
  - → Optics optimized for otendoscopy.

RobOtol® dedicated navigation system

- **Development of a new navigation system with additional functions**
  - → Better management of modalities (scanner, MRI, etc.)
  - → Management of the implant insertion axis
  - → Innovative patient registration
  - → **Addition of information with the augmented reality**

Addition of a drug injection system

- Procedure and tools developed in collaboration with research units using laboratory manipulations (INSERM, Institut Pasteur, American universities)


THANKS