



Impact Report

2020

Luzern, April 2021

Our vision

ON, the orthoregeneration network is an independent internationally active foundation in the field of orthopedic tissue regeneration driving the development and understanding of new treatment strategies for the well-being of the patient.



Our mission

- *drive innovation*
- *improve clinical practice*
- *foster a network*
- *help the patient*

Our mission

drive innovation

improve clinical practice

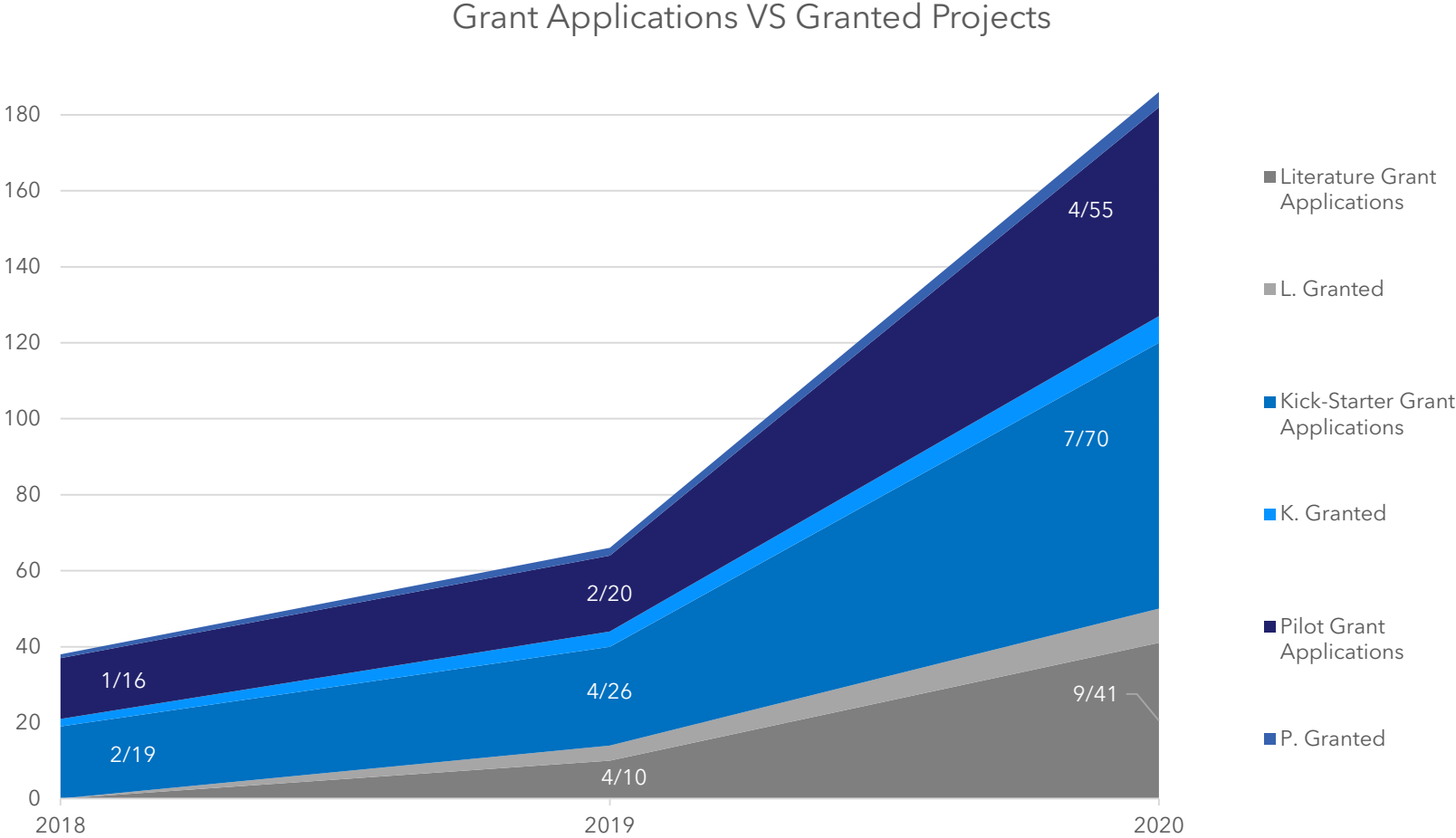
foster a network

help the patient

Success / Impact

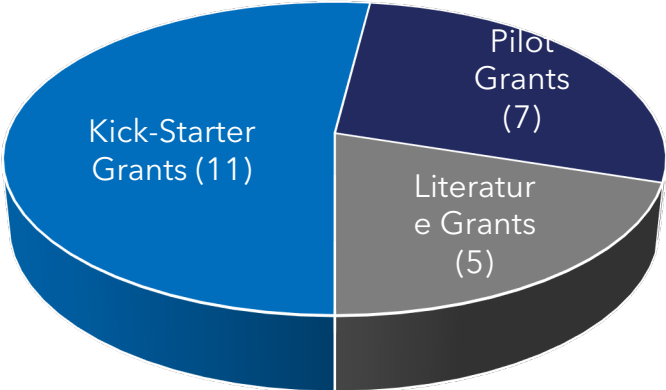
- Funded research projects
- Published results
- Created follow-up funding
- Filed patents
- Products & techniques
- Created research networks

Granted Projects VS Total Applications

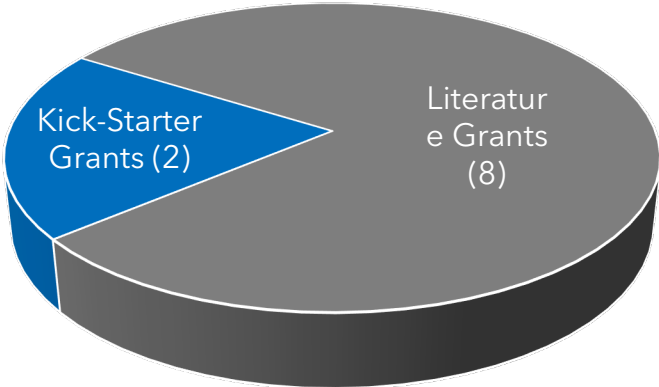


ONgoing projects vs published projects

ONgoing projects



Published projects



References of publications in 2020

Eight Literature Grant publications (1/2):

- Murray, I. R., Chahla, J., Frank, R. M., Piuzzi, N. S., Mandelbaum, B. R., Dragoo, J. L., & Members of the Biologics Association (2020). Rogue stem cell clinics. *The bone & joint journal*, 102-B(2), 148-154. www.ncbi.nlm.nih.gov/pmc/articles/PMC7002842/
- Gilat R, Haunschild ED, Tauro T, Cole BJ. Recommendation to Optimize Safety of Elective Surgical Care While Limiting the Spread of COVID-19: *Primum Non Nocere*. *Arthrosc Sports Med Rehabil*. 2020 Apr 27;2(3):e177-83. doi: 10.1016/j.asmr.2020.04.008. Epub ahead of print. PMID: 32342047; PMCID: PMC7183963. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7183963/>
- Ambrosio L, Vadalà G, Russo F, Papalia R, Denaro V. The role of the orthopaedic surgeon in the COVID-19 era: cautions and perspectives. *J Exp Orthop*. 2020 May 27;7(1):35. doi: 10.1186/s40634-020-00255-5. PMID: 32458150; PMCID: PMC7250587. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7250587/>
- Mouton C, Hirschmann MT, Ollivier M, Seil R, Menetrey J. COVID-19 - ESSKA guidelines and recommendations for resuming elective surgery. *J Exp Orthop*. 2020 May 13;7(1):28. doi: 10.1186/s40634-020-00248-4. PMID: 32405872; PMCID: PMC7220621. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7250587/>

References of publications in 2020

Eight Literature Grant publications (2/2):

- Hussain, Z. B., Shoman, H., Yau, P., Thevendran, G., Randelli, F., Zhang, M., Kocher, M. S., Norrish, A., & Khanduja, V. (2020). Protecting healthcare workers from COVID-19: learning from variation in practice and policy identified through a global cross-sectional survey. *Bone & joint open*, 1(5), 144-151. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7684385/>
- Lakhani A, Sharma E. Corona virus (Covid-19) - ITS implications in pediatric orthopedic care. *J Orthop*. 2020 Jun 13;21:326-330. doi: 10.1016/j.jor.2020.06.002. PMID: 32684674; PMCID: PMC7292955. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7292955/>
- Steppe L, Liedert A, Ignatius A, Haffner-Luntzer M. Influence of Low-Magnitude High-Frequency Vibration on Bone Cells and Bone Regeneration. *Front Bioeng Biotechnol*. 2020 Oct 21;8:595139. doi: 10.3389/fbioe.2020.595139. PMID: 33195165; PMCID: PMC7609921. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7609921/>
- Robinson PG, Williamson T, Murray IR, Al-Hourani K, White TO. Sporting participation following the operative management of chondral defects of the knee at mid-term follow up: a systematic review and meta-analysis. *J Exp Orthop*. 2020 Oct 6;7(1):76. doi: 10.1186/s40634-020-00295-x. PMID: 33025212; PMCID: PMC7538489. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7538489/>

References of publications in 2021

Two Kick-Starter Grant publications in 2021:

- Copp ME, Flanders MC, Gagliardi R, Gilbertie JM, Sessions GA, Chubinskaya S, Loeser RF, Schnabel LV, Diekman BO. The combination of mitogenic stimulation and DNA damage induces chondrocyte senescence. *Osteoarthritis Cartilage*. 2021 Mar;29(3):402-412. doi: 10.1016/j.joca.2020.11.004. Epub 2020 Nov 20. PMID: 33227437. <https://pubmed.ncbi.nlm.nih.gov/33227437/>
- Tang S, Salazar-Puerta A, Richards J, Khan S, Hoyland JA, Gallego-Perez D, Walter B, Higuera-Castro N, Purmessur D. Non-viral reprogramming of human nucleus pulposus cells with FOXF1 via extracellular vesicle delivery: an in vitro and in vivo study. *Eur Cell Mater*. 2021 Jan 19;41:90-107. doi: 10.22203/eCM.v041a07. PMID: 33465243. <https://pubmed.ncbi.nlm.nih.gov/33465243/>

ON Grants



Awarded Projects

Claudia di Bella (ICRS 18)	3D in-situ bioprinting of articular cartilage
Zeynep Bal (EORS 18)	A New Composite Biomaterial of Osteoconductive Nanohydroxyapatite (NHAP), Synthetic Polymer (PLA-PEG) and Bone Morphogenic Protein-2 (RHBMP-2) for Bone Regeneration
Ronak Reshamwala (Eurospine 18)	A novel surgical approach for transplantation of olfactory ensheathing cells following a transection type spinal cord injury in mice
Marianne Comeau-Gauthier (ICORS 19)	Unleashing β -catenin with a new anti-Alzheimer drug for bone tissue regeneration
Joshua Everhart (AOSSM 19)	Platelet-Rich Plasma: Does It Decrease Meniscus Repair Failure Risk?
Lian Wei Shiung (EORS 19)	Methylated Histone Pathway Modulation of Cartilage Integrity and Osteoarthritis
Hajime Utsunomiya (ORS 19)	Long term Improvement of Cartilage Repair in Rabbit Osteochondral Defect Model With Biologically Regulated Bone Marrow Stimulation by Losartan Administration
Adam Hexter (EORS 20)	Decellularized Porcine Xenograft for Anterior Cruciate Ligament Reconstruction: A Histological Study in Sheep Comparing Cross Pin and Cortical Suspensory Femoral Fixation
Horea Benea (ESSKA 20)	Comparative assessment of healing focal lesions of articular cartilage in an animal model by using stem cells from the iliac crest versus stem cells from adipose tissue
Chia-Lung Wu (ORS 20)	Single Cell Transcriptomic Analysis of Human Pluripotent Stem Cell Chondrogenesis
Chenshuang Li (ORS 21)	From A Skin Biopsy to Musculoskeletal Tissue Regeneration - A Single Protein Reprogramming Approach

ON Awards



Our mission

drive innovation

improve clinical practice

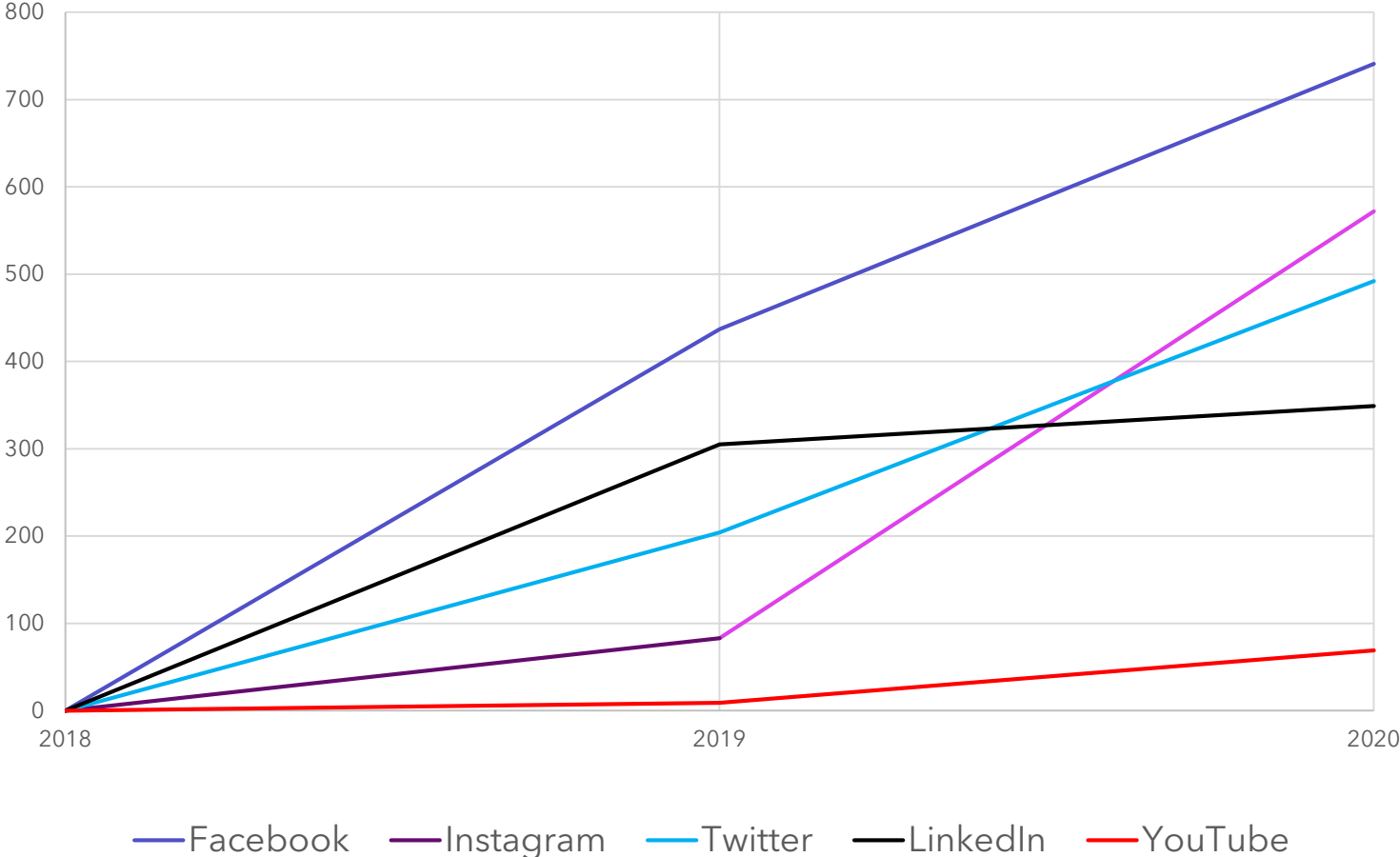
foster a network

help the patient

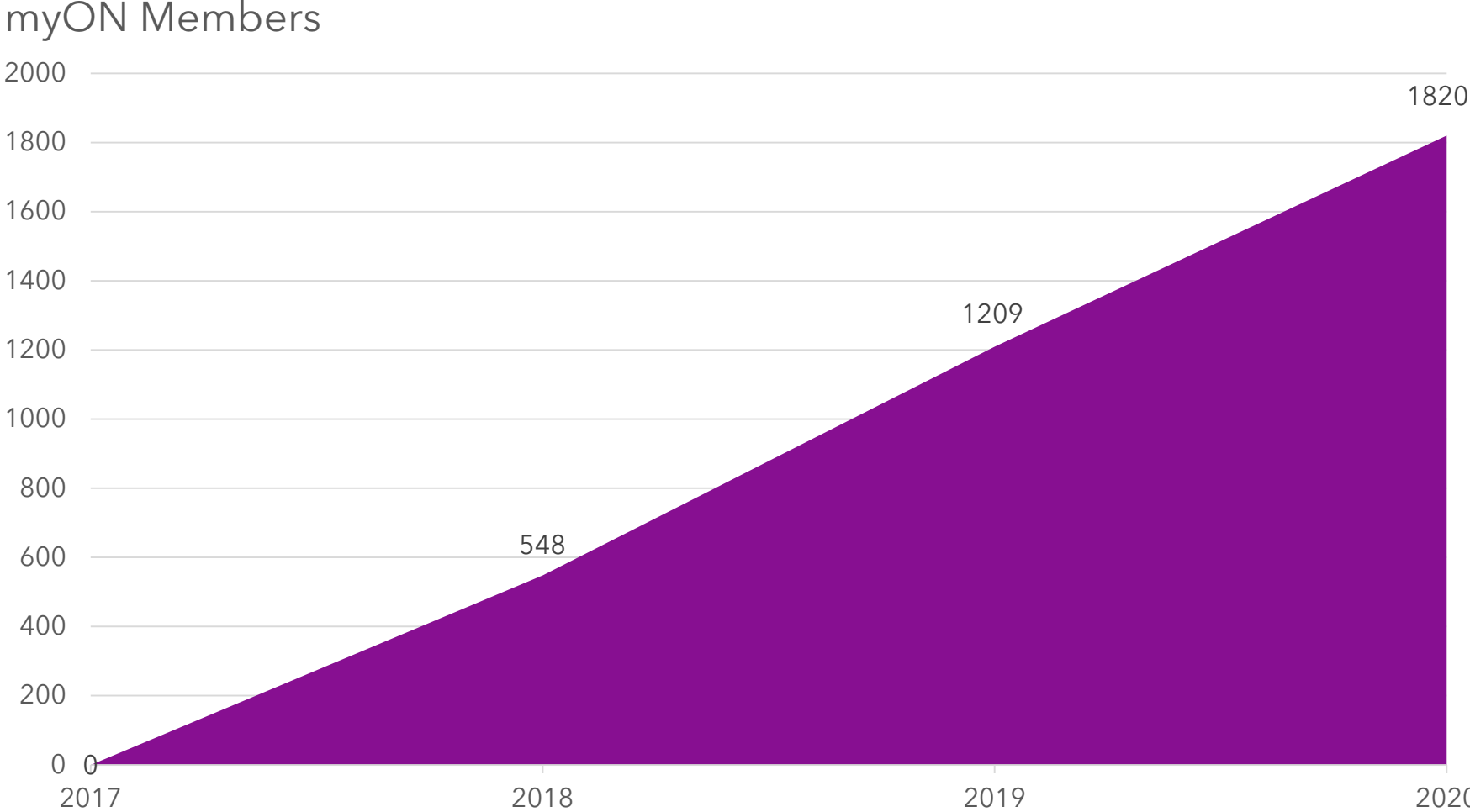
Success / Impact

- Number of members
- Inclusion of high impact experts
- Contact to most important research institutions
- Contact to most important clinics
- Reach to surgeons and scientists
- Partnerships with societies

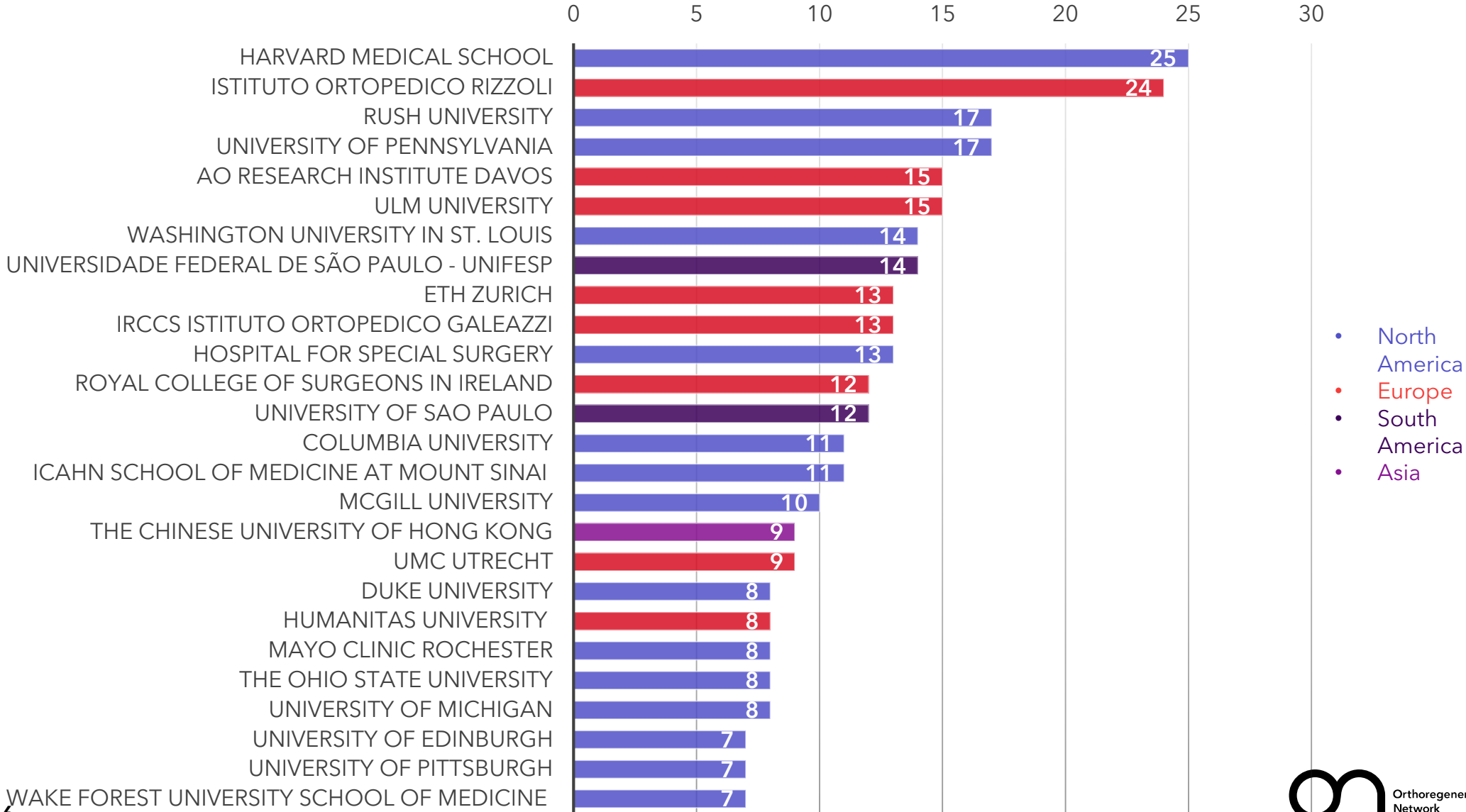
Number of ON Social Media Followers



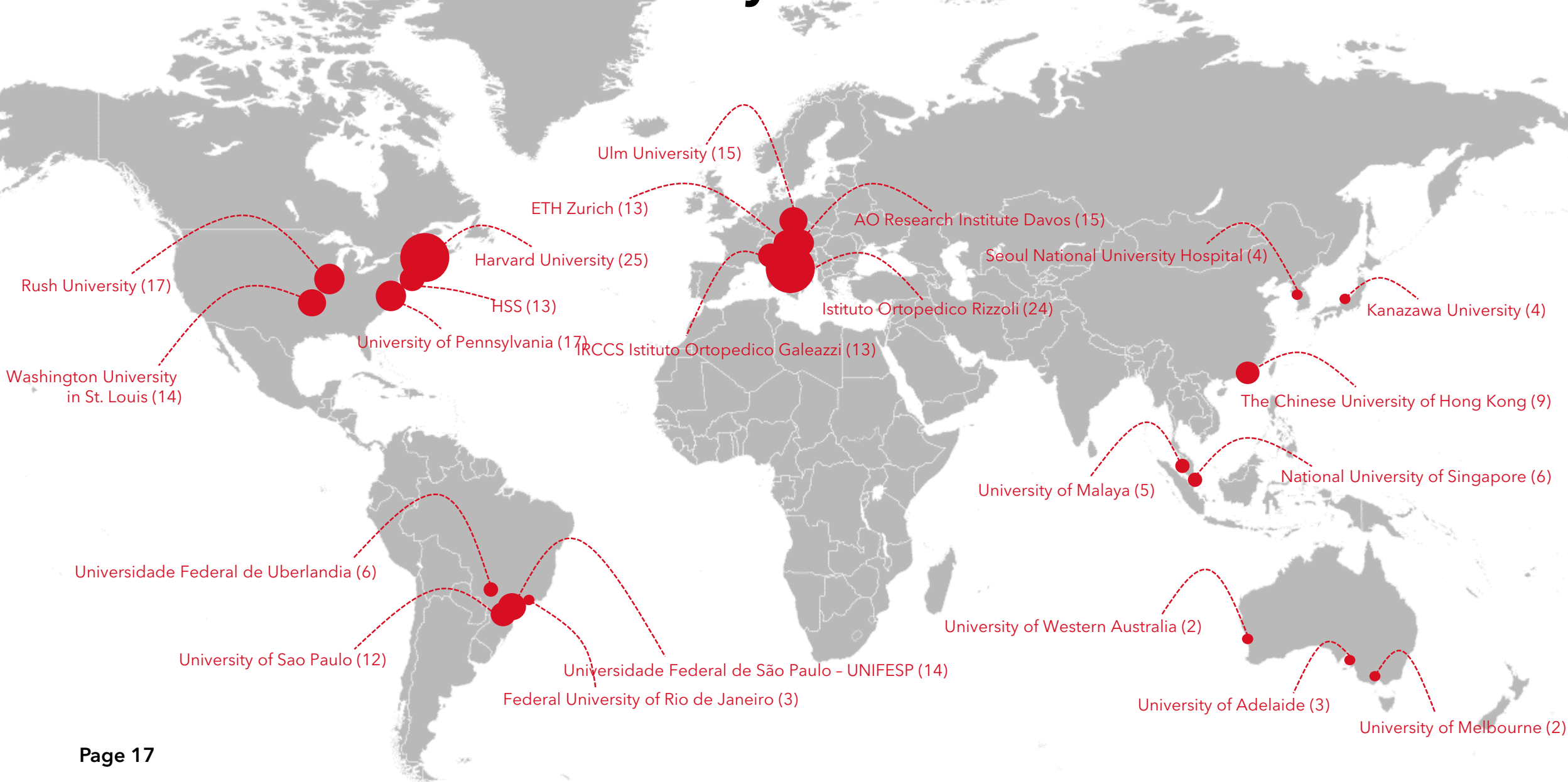
Number of myON Members



myON Members per Institution (Top 25)



Institutions with most myON Members



ON Collaborations

2020



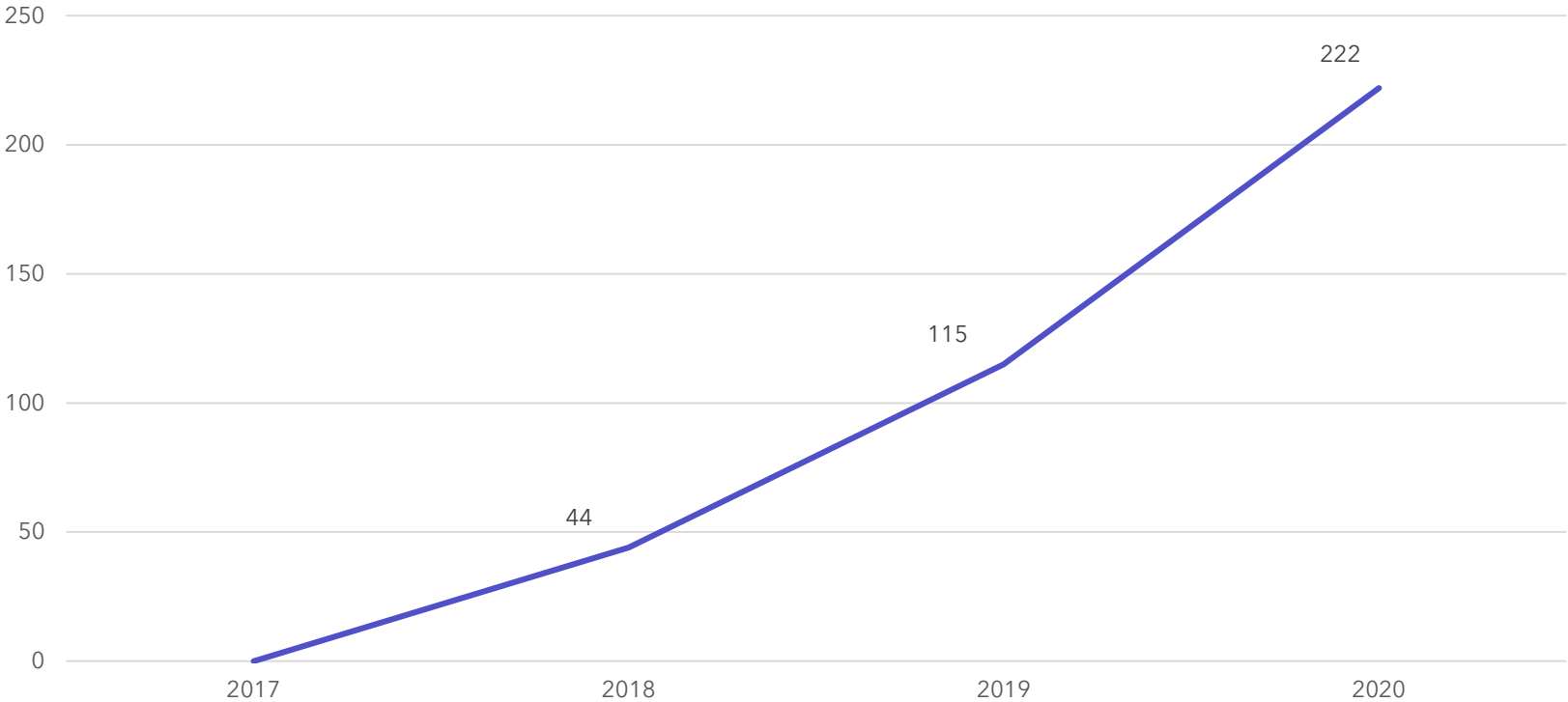
2019



2018

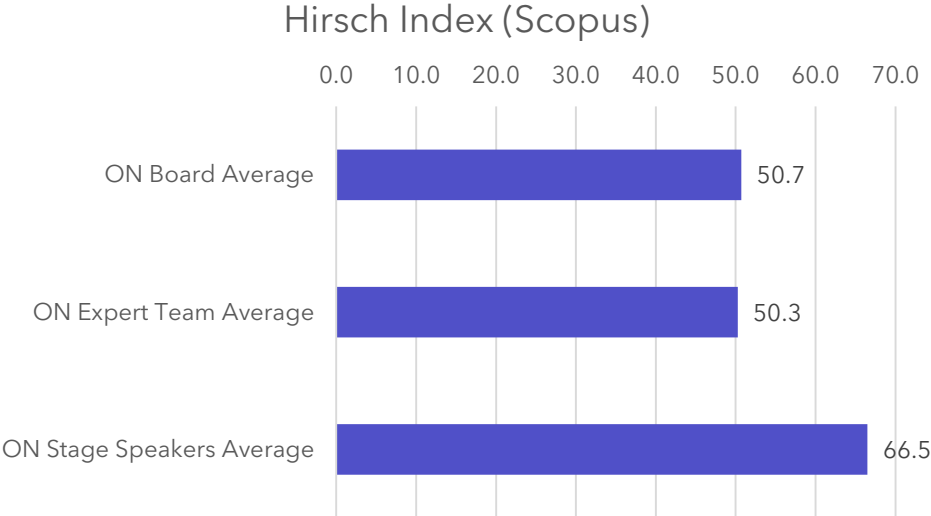
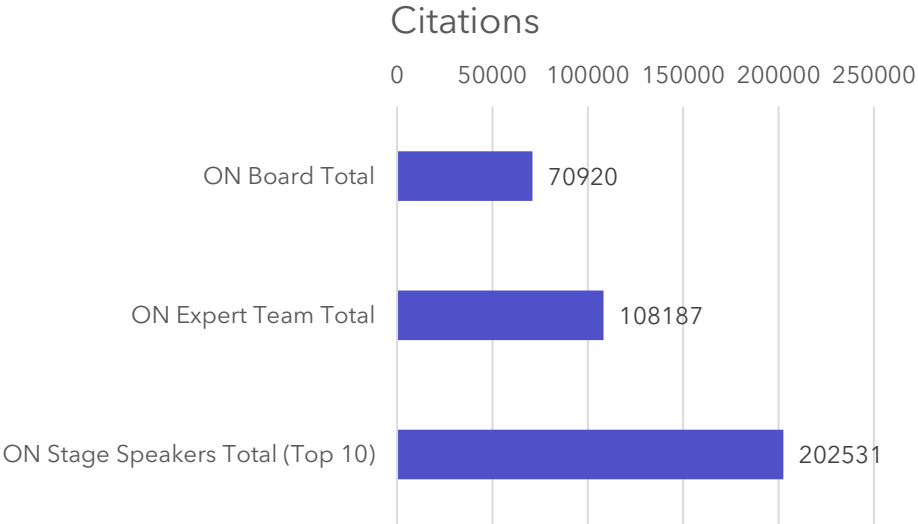
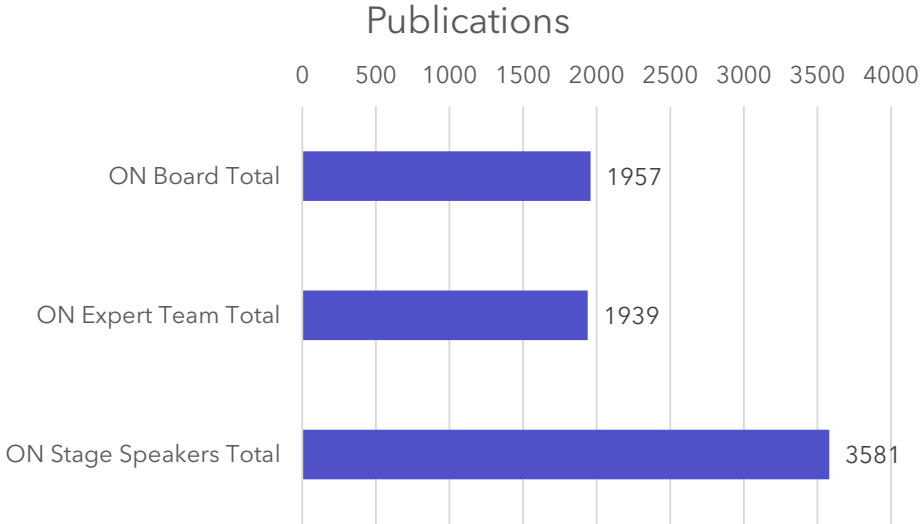


ON Alumni



- Approx. 50% of Grantees have become involved in other programs (e.g. other grants) and actively supported ON (e.g. reviewer, author, surveys)
- Some Alumni start into a career

Impact of ON Board / Expert Team / Speakers



The ON Faculty

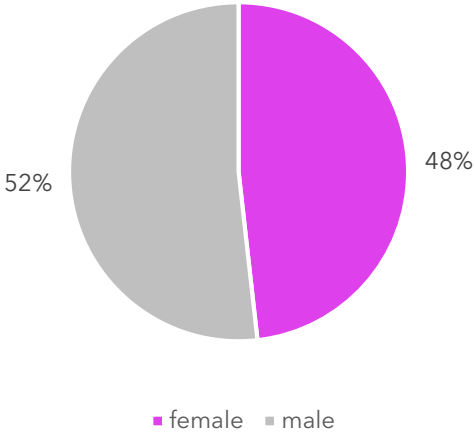
Hogan MaCalus V. Calder James D. F. **Karp Jeff** Strauss Eric J. Vannini Francesca Vidal Armando F.
Kearns Stephen R. Raikin Steven M. **Van Osch Gerjo** Letterman Christian
Van Dijk Niek Smyth Niall Haverkamp Daniel Kennedy John G.
Ferkel Eric I. Shimozono Yoshiharu **Taylor William** Fortier Lisa A. Gobbi Alberto
Walther Markus Wiewiorski Martin Frank Rachel **Kraus Virginia**
Spector Myron Murawski Christopher Sullivan Martin
Valderrabano Victor Thordarson David B. Ferkel Richard Vadala Gianluca
Matthews Gloria Stone James W. **Vunjak-Novakovic Gordana**
Cole Brian Provencher Mathew T. Verdonk Peter
Pereira Helder **Nunley James A.** Dragoo Jason **Malda Jos** Laver Ron
Gomoll Andreas Kramer Dennis **Rodeo Scott** Saris Daniel
Kuntz Andrew Wellington Hsu Pearce Christopher J. Passuti Norbert
Docheva Denitsa



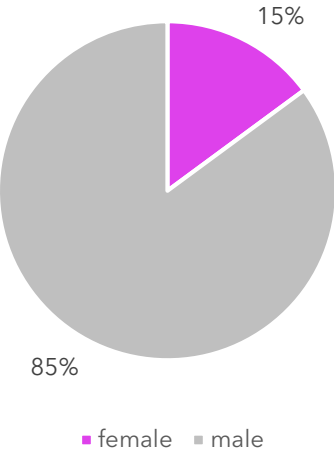
Gender Diversity

Gender Diversity in Orthopedics

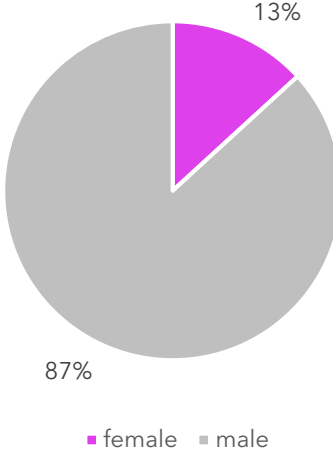
Medical School Graduates (US)



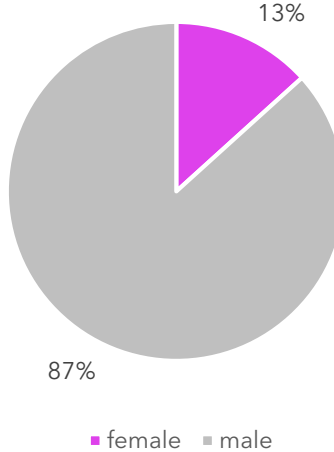
Orthopaedic Surgery Applicants (US)



Full-time Orthopaedic Surgery Faculty (US)



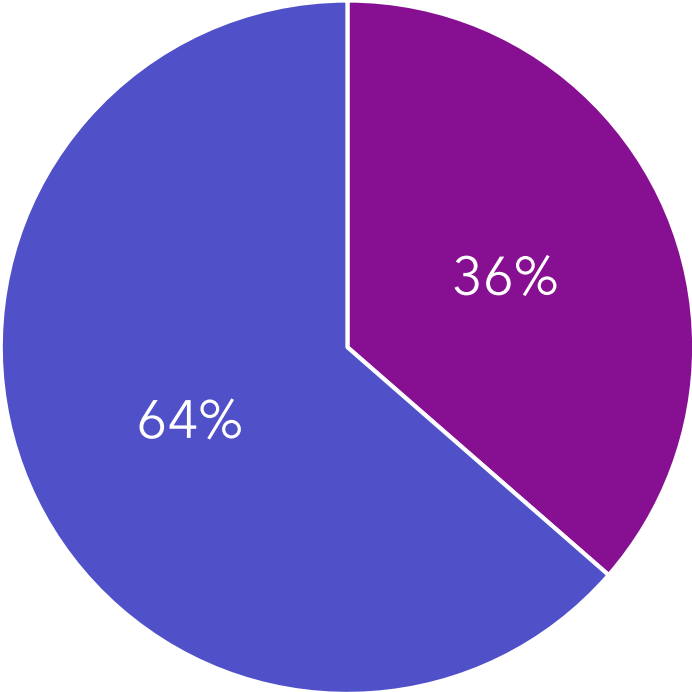
Orthopedic Academic Positions (Canada)



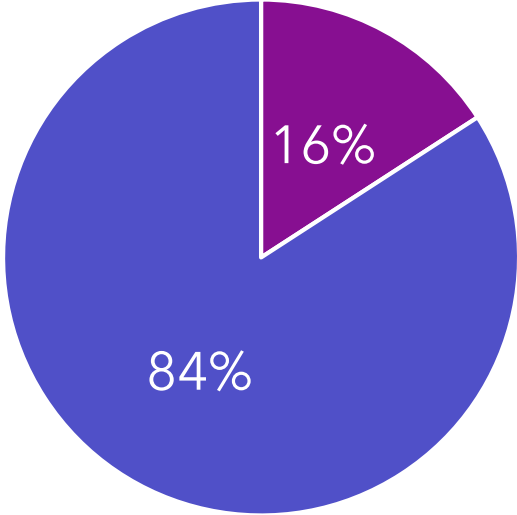
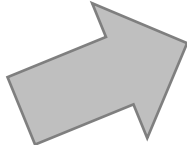
Gender Diversity ON Alumni

All Alumni

N = 176

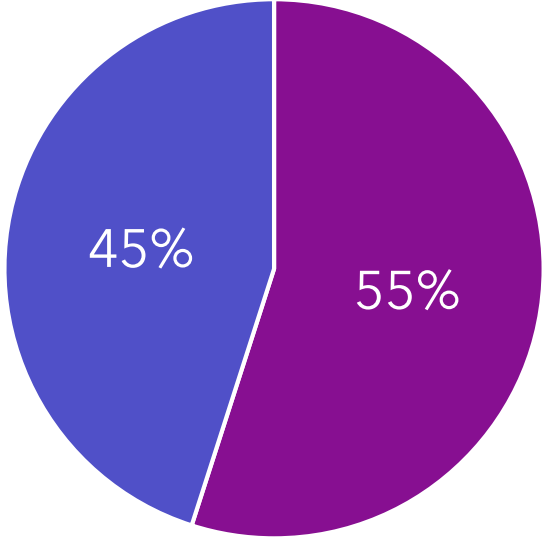


■ female ■ male



Clinicians

N = 82

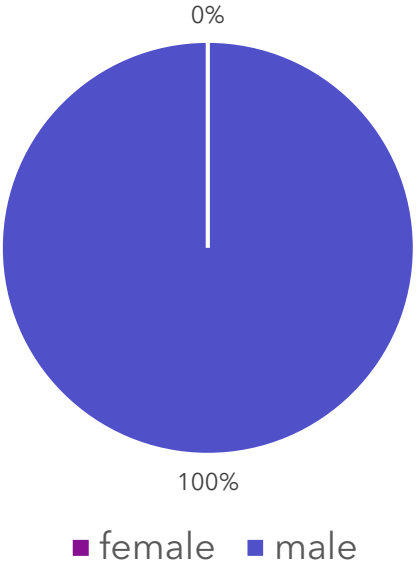


Scientists

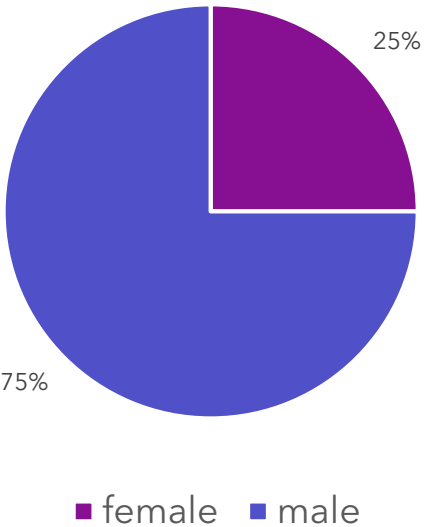
N = 91

Gender Diversity ON Team

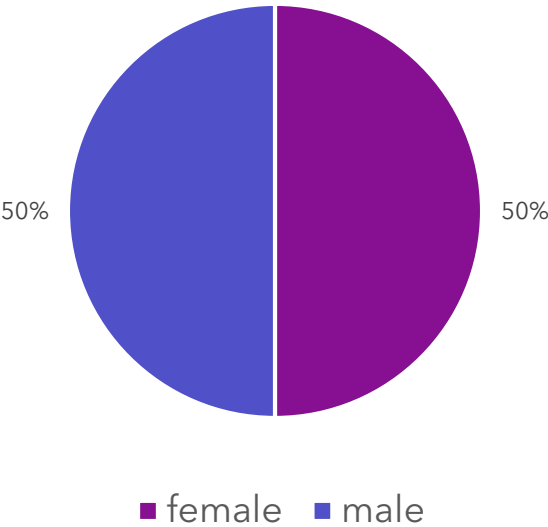
ON Board



ON Expert Team

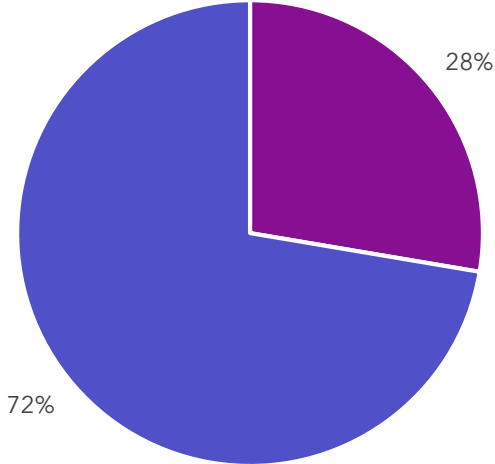


ON Office



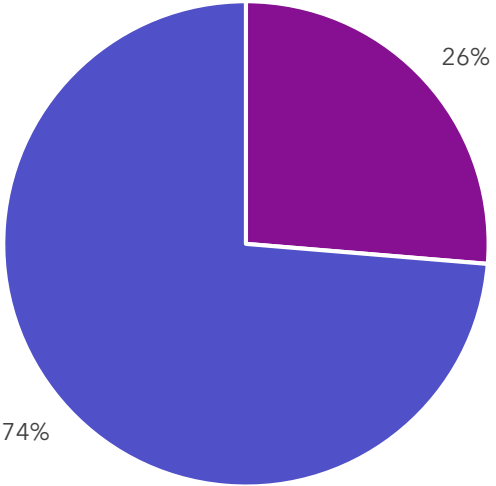
Gender Diversity ON Contributors

ON Faculty



■ female ■ male

ON Reviewer



■ female ■ male

Our mission

drive innovation

*improve clinical
practice*

foster a network

help the patient

Success / Impact

- Sharing of knowledge
- Improved decision making
- Application of new or better techniques
- Collaboration with and support of clinical societies

Clinical Education



Keynotes & Sessions



ONstage



ONcases



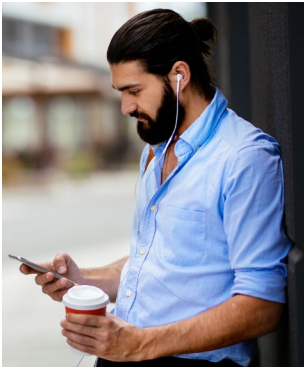
ONcase Night



Consensus



Clinical Fellowship



ON the go

Analysis of impact ongoing

Our mission

drive innovation

improve clinical practice

foster a network

help the patient

Success / Impact

- Patients treated following clinical guidelines shared by ON
- Patient treated by surgeons educated by ON
- Patients treated with materials or methods developed with the support of ON
- Treatment success

Patient Benefit

Too early to determine. Impact on patient benefit is a medium to long term objective

