




Laboratory Name	Biomaterials Lab	
Main Goals	Research and development of new dental materials and dental materials properties mainly related to resin composites, adhesive systems and bleaching agents.	

Lab Head	Mário Cruz Polido, PhD
Group	Ana Azul (PhD) Alexandra Pinto (PhD) Inês Caldeira Fernandes (PhD) Ana Vieira (PhD) Ana Paula Serro (PhD) Carla Ascenso (PhD) Pedro Mariano Pereira (PhD) Pedro Melo e Moura (PhD) Joana Vasconcelos e Cruz (PhD) Inês Caetano Santos (MSc) Miguel Alves (MSc) Students
Senior Researchers	
PhD Students	



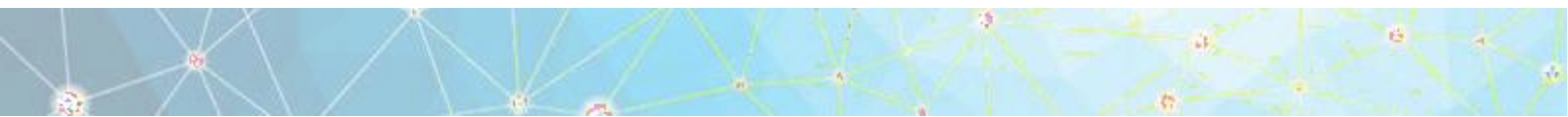
**Research Projects
(from 2013)**

1. Uma visão molecular da restauração dentária. PTDC/SAU-BMA/122444/2010. De: 2010 até: 2013
2. Molecular Design for Dental Restoration. FCT-P2020/SAICT- POL/24288/2016). De: 2018 até: 2020
3. 3D-DentalPrint – Additive manufacturing of zirconia and nanostructured alumina/zirconia dental prosthesis. 02/SAICT/2016/023940 (FCT). De: 2017 Até: 2019
4. Formulação de um adesivo dentário universal experimental e estudo das suas propriedades físico-químicas e adesivas. De: 01/04/2015 Até: ao presente

**Publications (10
most relevant, last 5
years)**

1. Effect of H₂O₂ Solution's pH on the Human Enamel Micro and Nanowear. Branco, A. C., Rodrigues, I., Paradiso, P., Polido, M., Colaço, R., Figueiredo-Pina, C. G., & Serro, A. P. (2020). Tribology Letters, 68(4), 1-14.
2. Challenges in matrix metalloproteinases inhibition. Laronha, H., Carpinteiro, I., Portugal, J., Azul, A., Polido, M., Petrova, K. T., ... & Caldeira, J. (2020). Biomolecules, 10(5), 717.
3. Dentin bonding and SEM analysis of a new experimental universal adhesive system containing a dendrimer. Vasconcelos e Cruz, J., Polido, M., Brito, J., & Gonçalves, L. L. (2020). Polymers, 12(2), 461.
4. Suitability of 3D printed pieces of nanocrystalline zirconia for dental applications. Branco, A. C., Silva, R., Santos, T., Jorge, H., Rodrigues, A. R., Fernandes, R., ... & Figueiredo-Pina, C. G. (2020). Dental Materials, 36(3), 442-455.
5. Tribological performance of the pair human teeth vs 3D printed zirconia: An in vitro chewing simulation study. Branco, A. C., Silva, R., Jorge, H., Santos, T., Lorenz, K., Polido, M., ... & Figueiredo-Pina, C. G. (2020). Journal of the Mechanical

6. A new experimental adhesive system containing G-IEMA – Physicochemical properties. JV Cruz, LL Gonçalves, J Brito, M Polido. J Adhesion Science and Technology, 33:4, 418-432. DOI: 10.1080/01694243.2018.1539154
7. Comparative study of the wear of the pair human teeth/Vita Enamic® vs commonly used dental ceramics through chewing simulation. F. Santos, A. Branco, M. Polido, A.P. Serro, C.G. Figueiredo-Pina. Journal of the Mechanical Behavior of Biomedical Materials, 2018; 88: 251–260. Doi:10.1016/j.jmbbm.2018.08.029
8. Human ex vivo dentin-pulp complex preservation in a full crown model. J Botelho, MA Cavacas, G Borrecho, M Polido, P Oliveira, J Martins Dos Santos. Journal of Oral Biology and Craniofacial Research, 2017; 7(1): 19–22. DOI:[10.1016/j.jobcr.2016.12.002](https://doi.org/10.1016/j.jobcr.2016.12.002)
9. Effect of bleaching teeth with hydrogen peroxide on the morphology, hydrophilicity, and mechanical and tribological properties of the enamel. FT Rodrigues, AP Serro, M Polido, A





Ramalho, CG Figueiredo-Pina. *Wear*, 2017; (374–375): 21–28. DOI:[10.1016/j.wear.2016.11.001](https://doi.org/10.1016/j.wear.2016.11.001)

Patents

1. Formulação para um Sistema Adesivo Dentário Universal contendo um monómero de reticulação Dentrítico de Segunda Geração. Outubro 2018.

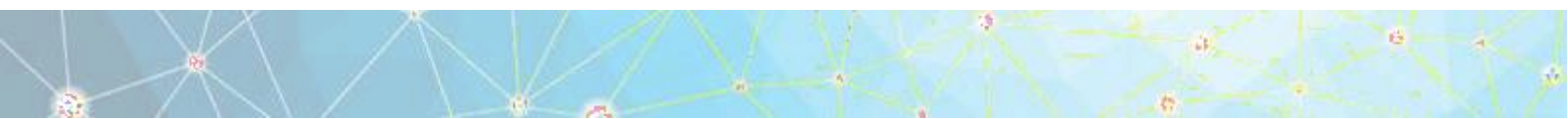
Abstracts publicados em revistas indexadas

1. Physicochemical, mechanical and SEM characterization of a new experimental adhesive containing G-IEMA. Joana Vasconcelos e Cruz, Luísa L. Gonçalves, José Brito & Mário Polido (2019). *Annals of Medicine*, 51:sup1, 149 DOI: 10.1080/07853890.2018.1561992.
2. Spectrophotometric analysis of coronal discoloration in-vitro induced by various bioceramic cement. Joana Carvalho, Carlos Franco, João A. Neves, Mário Polido, Ana Cristina Azul (2019). Joint 3rd International Congresses of CiiEM “Research & Innovation in Human and Health Sciences” and the “UNESCO Chair for Teaching & Research in Digital Anatomy Paris Descartes, 2018”, *Annals of Medicine*, 51:sup1, i-vii DOI: 10.1080/07853890.2018.1563379
3. Depth of cure of bulk-fill light cured composite resins with different initiators. Andreia Santos, Luís Proença, Mário Polido, Ana Cristina Azul (2019). Joint 3rd International Congresses of CiiEM “Research & Innovation in Human and Health Sciences” and the “UNESCO Chair for Teaching & Research in Digital Anatomy Paris Descartes, 2018”, *Annals of Medicine*, 51:sup1, i-vii DOI: 10.1080/07853890.2018.1563379
4. SEM-EDS nanoleakage evaluation of universal-adhesive-systems with etch-and-rinse and self-etch approach. Mihai Certan, Mário Polido, José Brito, Ana Cristina

- Azul (2019). Joint 3rd International Congresses of CiiEM “Research & Innovation in Human and Health Sciences” and the “UNESCO Chair for Teaching & Research in Digital Anatomy Paris Descartes, 2018”, *Annals of Medicine*, 51:sup1, i-vii DOI: 10.1080/07853890.2018.1563379
5. Microtensile bond strength evaluation to dentin of new universal adhesive systems. Miguel Alves, Mário Polido, José Brito, Ana Cristina Azul (2019) Joint 3rd International Congresses of CiiEM “Research & Innovation in Human and Health Sciences” and the “UNESCO Chair for Teaching & Research in Digital Anatomy Paris Descartes, 2018”, *Annals of Medicine*, 51:sup1, i-vii DOI: 10.1080/07853890.2018.1563379
 6. Subtractive vs additive manufacturing in the production of zirconia pieces for dental applications. A. Branco, R. Silva, A. P. Serro, M. C. Polido & C. G. Figueiredo-Pina *Annals of Medicine*, Volume 51, 2019 - Issue sup1
 7. The effect of different desensitizing strategies on eroded dentin: ex vivo study. Santos Solange, Ascenso Carla, Carmo Joana, Peixoto André, Polido Mário & Manso Ana Cristina. *Annals of Medicine*, Volume 51, 2019 - Issue sup1
 8. IC Santos, TB Salgueiro, JJ Mendes, AHS Delgado, J Brito, AC Azul, M Polido. Microtensile bond strength of a novel resin-modified glass ionomer adhesive. *Dental Materials*, 2018; 34 (S1), e104. Doi: 10.1016/j.dental.2018.08.217.
 9. Inhibitors for matrix metalloproteinases, molecular design for dental restoration. H Silva, R Chaves, H Loronha, Fabiana Vicente, C Branco, K Petrova, AC Azul, M Polido, J Caldeira. *Annals of Medicine*, Vol. 50:sup 1, S60-S61. (2018). doi.org/10.1080/07853890.2018.1427445
 10. Evaluation of microtensile bond strength of an Ormocer adhesive system – Admira Bond. F Marques, M Polido, J Brito, AC Azul. *Annals of Medicine*, Vol. 50:sup 1, S61-S62. (2018). doi.org/10.1080/07853890.2018.1427445
 11. Resin-enamel microtensile bond strength evaluation of two universal adhesive systems in both etch-&-rinse and self-etch approach. M Polido, P Moreno, M Santos, J Brito, AC

Azul. Annals of Medicine, Vol. 50:sup 1, S62-S63. (2018).
doi.org/10.1080/07853890.2018.1427445

12. Effect of different gel bleaching agents on microtensile bond strength to enamel. IC Santos, Antonio HS Delgado, N Silva, J Brito, M Polido, JJ Mendes. Annals of Medicine, Vol. 50:sup 1, S63-S64. (2018).
13. Surface treatments effect on ITBS of a resin-nano-ceramic. P Monteiro, I Madeira, J Rua, JJ Mendes, AC Azul, M Polido. Annals of Medicine, Vol. 50:sup 1, S64-S65. (2018).
doi.org/10.1080/07853890.2018.1427445
14. Physicochemical and dentin adhesion studies of a new experimental universal dental adhesive without Bis-GMA. JV Cruz, LL Gonçalves, M Freire, J Brito, A Aguas, M Polido. Annals of Medicine, Vol. 50:sup 1, S65. (2018). doi.org/10.1080/07853890.2018.1427445
15. Wear resistance evaluation of prosthetic dental materials. AF Santos, M Polido, AP Serro, CG Figueiredo-Pina. Annals of Medicine, Vol. 50:sup 1, S67-S68. (2018).
doi.org/10.1080/07853890.2018.1427445
16. Efficacy evaluation of carbamide and hydrogen peroxide as internal bleaching agents. MP Silva, IC Fernandes, A Pinto, I Carpinteiro, M Polido, AC Azul, L Proença. Annals of Medicine, Vol. 50:sup 1, S101-S102. (2018).
doi.org/10.1080/07853890.2018.1427445
17. Enamel bleaching with H₂O₂ solutions: effect of pH. A Branco, M Polido, AP Serro, CG Figueiredo-Pina. Annals of Medicine, Vol. 50:sup 1, S102-S103. (2018).
doi.org/10.1080/07853890.2018.1427445





18. Immediate Microleakage in Direct and Indirect Restorative Procedures. J Nunes da Cruz, AC Azul, P Moura, M Polido. J Dent Res 96(Spec Iss B): 0294,2017
19. Comparative Tribological Study of Two Prosthetic Dental Materials: Zirconia and Vita Enamic. Proceedings of BALTRIB'2017. (2017), conference-abstract DOI: [10.15544/baltrib.2017.29](https://doi.org/10.15544/baltrib.2017.29)
20. Study of the Effect of H₂O₂ Used in Whitening Treatments on Human Enamel Wear Resistance. Proceedings of BALTRIB'2017. (2017) conference-abstract DOI:10.15544/baltrib.2017.22
21. AF Marques, M Polido, AM Azul, J Brito. Estudo das propriedades mecânicas do material de restauração de Ormocer®. Rev Port Estomatol Med Dent Cir Maxilofac 2017; 58 (S1): 33-34.doi.org/10.24873/j.rpemd.2017.12.112
22. B Martins, PM Moura, L Proença, AM Azul, M Polido. Influência de adesivos universais na reparação de cerâmica de dissilicato de lítio. Rev Port Estomatol Med Dent Cir Maxilofac 2017; 58 (S1): 40- 41. [doi:10.24873/j.rpemd.2017.12.129](https://doi.org/10.24873/j.rpemd.2017.12.129)



Equipment/Techniques

UNIVERSAL TESTING MACHINE

Equipped with a 50 kN loading cell and a 5 kN loading cell.
Shimadzu AG-50kNI SD MS, Shimadzu Corporation, Kyoto,
Japan

MICROHARDNESS TESTING MACHINE

Shimadzu HSV-30, Shimadzu Corporation, Kyoto, Japan

HARD TISSUE MICROTOME

Accutom-50, Struers, Denmark

HARD TISSUE MICROTOME

Isomet 1000, Buehler, IL, EUA

POLISHING MACHINE

LaboForce-1, Struers, Denmark

THERMOCYCLING MACHINE

Mechatronik, THE 1100/230, Mechatronik, Germany

INCUBATION OVEN

Memmert INE 400, Memmert, Germany

STERILIZATION OVEN

Memmert UNB 400, Memmert, Germany

Ph METER

Crison GLP 22, Crison Instruments, Barcelona, Spain

RADIOMETER

Demetron 100, Demetron Research Corporation, Danbury, USA

PHOTOPOLIMERIZER

Optilux 501, Kerr, Middleton, USA

PHOTOPOLIMERIZER

Elipar Deep Cure-S, 3M ESPE, USA

HOTTE

Hotte, Industrial Laborum, Portugal

CHEWING SIMULATOR

Chewing Simulator CS-4.2, Mechatronik, Feldkirchen-Westerham, Germany



SANO CLAV

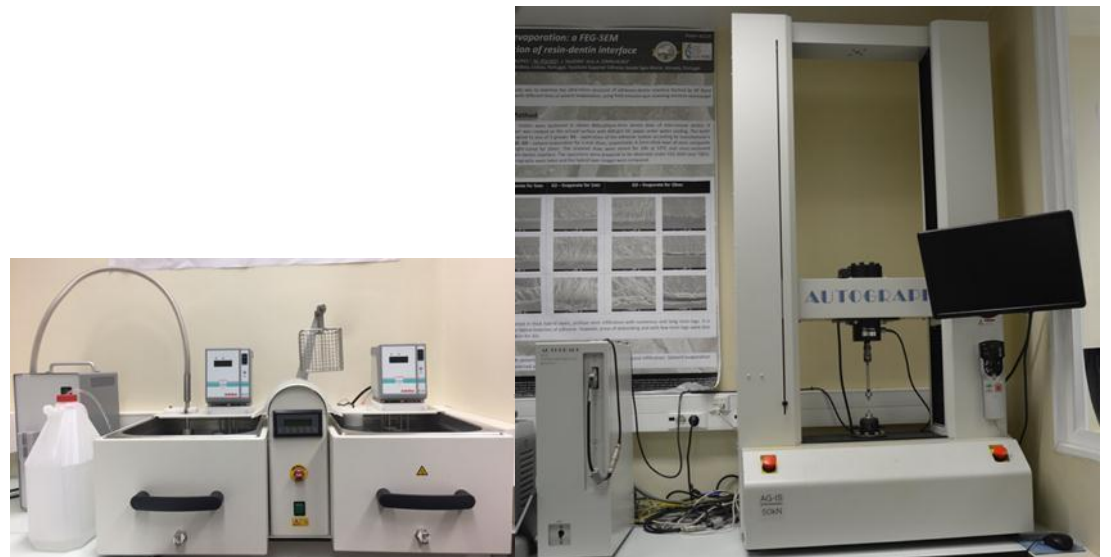
Sano Clav LAS-3-13-MCS-J, Adolf Wolf, Bad Uberkingen, Germany

SPECTROSHADE

Spectroshade Micro Optic, MHT S.p.A, Via Milano, Arbizzano di Negar,
Itália Software Version 2.40.

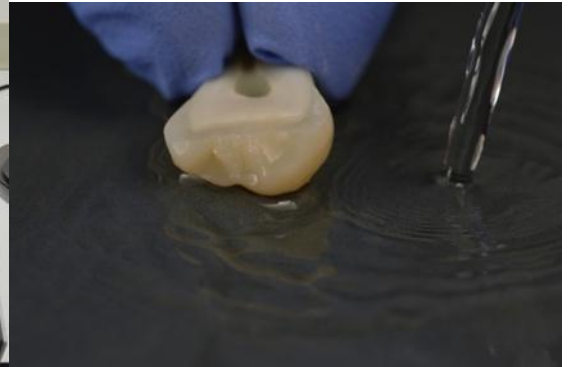
Announcements

Some Pictures





CENTRO
DE INVESTIGAÇÃO
INTERDISCIPLINAR
EGAS MONIZ



Location

Instituto Universitário Egas Moniz. Campus Universitário Egas Moniz - Quinta da Granja, Monte de Caparica, Portugal

Links

<http://ciem.egasmoniz.edu.pt/pt-pt/research/research-labs.aspx>