

PERSONAL INFORMATION

Paunescu Virgil



Sex | Date of birth | Nationality

WORK EXPERIENCE

- 2003- present **University Professor**
„Victor Babes” University of Medicine and Pharmacy Timisoara, Department III – Functional Sciences, Discipline of Immunology and Allergology, Biology, Eftimie Murgu Square No. 2A, Timisoara 300041, Romania, www.umft.ro
Specific teaching activities
Business or sector Education
- 2013- present **Primary Physician in Allergology and Clinical Immunology**
“Pius Brinzeu” Clinical County Emergency Hospital Timisoara, 156 Liviu Rebreanu Street, Timisoara 300723; OncoGen Centre – Centre for Gene and Cellular Therapies in the Treatment of Cancer; www.oncogen.ro
Coordinator of OncoGen Center
Business or sector Research and Medical services
- 1994- present **Primary Physician in Laboratory Medicine**
“Pius Brinzeu” Clinical County Emergency Hospital Timisoara, 156 Liviu Rebreanu Street, Timisoara 300723; OncoGen Centre – Centre for Gene and Cellular Therapies in the Treatment of Cancer; www.oncogen.ro
Specific research activities
Business or sector Research and Medical services

EDUCATION AND TRAINING

- 2013 **Primary MD certificate in Allergology and Clinical Immunology**
Romanian Health Ministry, Allergology and Clinical Immunology
- 1998 **Competence Certificate for Management of Medical and Social Services**
Romanian Health Ministry
- 1992-1996 **PhD in Medical Sciences**
Romanian Ministry of Health, Normal and Pathological Physiology, “Victor Babes” University of Medicine and Pharmacy Timisoara, Eftimie Murgu Square No. 2A, Timisoara 300041, Romania
Specific research activities; 1996- public presentation of the doctoral thesis: „Studies related to CD5+ B cells”, Scientific Coordinator Prof. Dr. Francisc Schneider

INFORMAȚII SUPLIMENTARE

A. Projects

International – Project coordinator

1. Romania-Serbia Joint Initiative against Cancer in Cross-Border Region: Improved Diagnosis and Treatment of Malignant Tumors (**ROSECAN**) – coordinator of Romanian team, programme INTERREG – IPA CBC Romania–Serbia, code eMS RORS-193, contract no. 93360/28.07.2017 (2017 – 2021)
2. Development of pan-European standards and criteria for the inspection of blood establishments. (**EU-Blood-Inspection – EUBIS**) – coordinator of Romanian team, programme SANCO, contract no. 2006202 (2007-2009)
3. European Optimal Blood Use Project. (**EUOBUP**) – coordinator of Romanian team, programme SANCO, contract no. 2006209 (2007-2009)
4. Implementation of European quality management system network for blood safety (**EU-Q-Blood-SOP**) – coordinator of Romanian team, programme SANCO, contract no. 2004217 (2005-2007)
5. Adult mesenchymal stem cells engineering for connective tissue disorders. From the bench to the bed side (**GENOSTEM**) – coordinator of Romanian team, programme FP 6 – Health (Priority 1), contract no. LSHB-CT-2003-506161 (2004-2007)

National – Project director

1. Center for Gene and Cellular Therapies in the Treatment of Cancer (ONCOGEN), programme POS-CCE, contract 852/14676, no. 261/28.09.2010 (competition A2-02.2.1.-2009-4) (2010-2015)
2. Development of New Technologies, Drugs and Vaccines for Prevention of SARS-CoV-2 (DECODE) – 11Sol/2020 (2020-2021)
3. Development of BIONanotechnologies based on Extracellular Vesicles, applied in early diagnostic, prognosis and therapy of atherosclerotic disease (BIOVEA) 83CCDI / 2018 (PN-III-P1-1.2-PCCDI-2017-0527) (2018-2021)
4. 3D Bioprinting Techniques for Building Tissue Constructs that Mimic the Tumor Microenvironment (DeLIMIT) 100PED/2017 (2017-2018)
5. Translating stem cell technologies to the conservation of highly endangered species (CONSENS), PNII-Partnerships No.120/2012 (2012-2016)
6. Tumor-associated fibroblasts as novel target in anti-tumor therapy – identification of origin, role and characteristic molecular markers, PNII-Ideii No. 318/2011 (2012-2016)
7. Studies regarding in vitro differentiation of mesenchymal stem cells towards adipocytes and validation of molecular factors involved in adipogenesis, PNII-Ideii No. 1748/2008 (2008-2011)
8. Genetic engineering of tumour stem cells for immunomodulation in cancers of non-viral origin (ONCOSTEM), PN II-Partnerships No. 41-019/2007 (2007-2010)

International – team member

1. Innovative strategies for prevention, diagnosis and therapy of ragweed pollen induced respiratory diseases (**INSPIRED**), contract no. P_37_747 (2016-2020)
2. Chimeric antigen receptor targeted oncoimmunotherapy with Natural Killer cells (CAR-NK) (2016-2020) Contract no. P_37_786 (2016 – 2020)
4. Regenerating Bone defects using New biomedical Engineering approaches (**REBORNE**), programme FP7, contract no. 241879 (2010-2014)
5. Cultivated Adult Stem Cells as Alternative for Damaged tissue (**CASCADE**), program FP7, contract no. FP7-223236 (2008-2011)
6. European Quality System for Tissue Banking, program SANCO, contract no. 2003209 (2004-2007)

National – team member

1. Optimizing the prevention methods for allergic patient management efficiency (**PREVALERG**), PN II – Partnerships programme, contract no. 41-011/2007 (2007-2010)
2. Innovative methods for inducing the immune tolerance to non-self phenotypes to avoid post-transplant rejects (**GREFACCEPT**), CEEX-PCD programme, contract no. 194-CEEX/PCD (2006-2008)
3. Research on isolation, cultivation and *in vitro* differentiation of pluripotent stem cells harvested from the inner ear, CEEX-ET programme, contract no. 80-CEEX/PCD (2006-2008)
4. Development of bio-orthopedics innovative techniques (**BIOART**), CEEX-VIASAN programme, contract no. 70/2006 (2006-2008)
5. Promotion of stem cell therapy research (**PRO-CELL-TERA**), CEEX programme Module III, contract no. 206/2006 (2006-2008)
6. Experimental studies on human mesenchymal stem cells transfected for developing an innovative therapeutic strategy of glioblastoma (**GLIOSTEMCELL**), CEEX programme Module I, contract no. 176/2006 (2006-2008)
7. Dendritic cells as immunotherapeutical vectors: modulation of their activity by the loading strategies, telomeres' length and telomerase activity, CEEX-RP programme, contract no. 3214/CEEX-RP (2005-2007)

8. **RONANOMED**- nanomedicine national integrated network, CEEEX – MATNANTECH programme, contract no. 42/2005 (2005-2007)
9. Development of a regional bank of stem cells from umbilical cord blood and placenta for autologous and autogenous transplantation (**STEMBANK**), VIASAN programme, contract no. 308/2004 (2004-2006)
10. Development of tissue bioengineering techniques for myocardial reconstruction (**CARDIOSTEM**), VIASAN programme, contract no. 311/2004 (2004-2006)
11. Assessment of cardiovascular risk factors in youth. Good practice models in health education, VIASAN programme, contract no. 464/2004 (2004-2006)
12. Development of biotechnologies for dendritic cell vaccines in solid tumours immunotherapy (**DENDRITECH**), BIOTECH programme, contract no. 4610/2004 (2004-2006)
13. Development of non-conventional medical techniques for optimizing the culture of living tissues obtained by tissue bioengineering, VIASAN programme, contract no. 313/2004 (2004-2006)
14. Microsensors and actuators for micro-opto-electromechanical systems obtained by alloys nano-engineering, MATNANTECH programme, contract no. 255(408)/2004 (2004-2006)
15. Assessment of the efficiency of new classes of antileukotriene therapy. In vivo and in vitro experimental studies, CNCSIS – type A programme, contract no. 1190-2004 (2004-2005)

B. Honor and rewards

- Knight of the „Faithful Service” National Order (2002)
- Knight of the „Romanian Star” National Order (2009)
- Vicepresident of the Romanian Academy of Medical Sciences
- President of the Timis Branch of the Romanian Academy of Medical Sciences

C. Books

1. Gherghiceanu M, Alexandru N, Magda SL, Constantin A, Nemezc M, Filippi A, Ioghen OC, Ceafalan LC, Bojin F, Tanko G, **Paunescu V**, Vinereanu D, Stepien E, Georgescu A. Part One: Extracellular Vesicles as Valuable Players in Diabetic cardiovascular Diseases. In Extracellular vesicles and Their Importance in Human Health, Ed. IntechOpen, 2019; DOI: 10.5772/intechopen.85225.
2. Ceafalan LC, Ioghen OC, Marta DC, Constantin A, Alexandru N, Nemezc M, Tanko G, Filippi A, Magda SL, Bojin F, **Paunescu V**, Vinereanu D, Georgescu A, Gherghiceanu M. Part Two: Extracellular Vesicles as a Risk factor in Neurogenerative Diseases. In Extracellular Vesicles and Their Importance in Human Health, Ed. IntechOpen, 2019; DOI: 10.5772/intechopen.85225.
3. Pros and cons on magnetic nanoparticles use in biomedicine and biotechnologies applications. In Nanoparticles’ Promises and Risks-Characterization, Manipulation and Potential Hazards to Humanity and Environment. Bojin F, **Paunescu V**, Springer Ed.2014, ISBN:978-3-319-11728-7.
4. Stem cells – an introductory overview, Tanasie G, Bojin F, Panaitescu C, **Paunescu V**. EUROBIT Ed., Timisoara 2011, ISBN 978-973-620-855-3

D. Memberships

- Federation of European Physiological Sciences
- Romanian Society of Physiological Sciences
- Romanian Society of Immunology
- European Society for Bone Marrow Transplantation
- European Association for Cancer Research

Publications

1. Tirziu A, Paunescu V. Cytotoxic T-Cell-Based Vaccine against SARS-CoV-2: A Hybrid Immunoinformatic Approach. *Vaccines*, 2022; 10(2): 218; DOI: 10.3390/vaccines10020218
2. Tirziu A, Paunescu V. Cytotoxic T-cell-based vaccine against SARS-CoV2: a hybrid immunoinformatic approach. *BioRxiv*, 2021, doi: <https://doi.org/10.1101/2021.09.26.461851>
3. Bojin F, Gavriiliuc O, Margineanu M, Paunescu V. Design of an Epitope-Based Synthetic Long Peptide Vaccine to Counteract the Novel China Coronavirus (2019 nCoV). *Preprints* 2020, 2020020102.
4. Constantin A, Comarita IK, Alexandru N, Filippi A, Bojin F, Gherghiceanu M, Vilcu A, Nemecz M, Niculescu LS, Paunescu V, Georgescu A. Stem cell-derived extracellular vesicles reduce the expression of molecules involved in cardiac hypertrophy- In a model of human-induced pluripotent stem cell-derived cardiomyocytes. *Frontiers in Pharmacology*, 2022; 13: 1003684; DOI: 10.3389/fphar.2022.1003684
5. Buzan MR, Zbircea LE, Gattinger P, Babaev E, Valenta R, Paunescu V, Panaitescu V, Chen KW. Complex IgE sensitization patterns in ragweed allergic patients: Implications for diagnosis and specific immunotherapy. *Clinical and Translational Allergy*, 2022; 12(7): e12179; DOI: 10.1002/ct2.12179
6. Lukinich-Gruia AT, Nortier J, Pavlovic NM, Milovanovic D, Popovic M, Draghia LP, Paunescu V, Tatu CA. Aristolochic acid I as an emerging biogenic contaminant involved in chronic kidney diseases: A comprehensive review on exposure pathways, environmental health issues and future challenges. *Chemosphere*, 2022; 297: 134111; DOI: 10.1016/j.chemosphere.2022.134111
7. Barbulescu GI, Buica TP, Goje ID, Bojin FM, Ordodi VL, Olteanu GE, Heredea RE, Paunescu V. Optimization of Complete Rat Heart Decellularization Using Artificial Neural Networks. *Micromachines*, 2022; 13(1): 79; DOI: 10.3390/mi13010079
8. Barbulescu GI, Bojin FM, Ordodi VL, Goje ID, Barbulescu AS, Paunescu V. Decellularized Extracellular Matrix Scaffolds for Cardiovascular Tissue Engineering: Current Techniques and Challenges. *International Journal of Molecular Sciences*, 2022; 23(21): 13040; DOI: 10.3390/ijms232113040
9. Bojin F, Robu A, Bejenariu MI, Ordodi V, Olteanu E, Cean A, Popescu R, Neagu M, Gavriiliuc O, Neagu A, Arjoca S, Paunescu V. 3D Bioprinting of model tissue that mimic the tumor microenvironment. *Micromachines*, 2021; 12: 535; DOI: 10.3390/mi12050535
10. Barbulescu GI, Bojin FM, Ordodi VL, Goje ID, Buica TP, Gavriiliuc OI, Baderca F, Hoinoiu T, Paunescu V. Innovative biotechnology for generation of cardiac tissue. *Applied Sciences*, 2021; 11: 5603.
11. Ivan A, Lam D, Cristea MI, Telea A, Gruia AT, Oprean C, Margineanu F, Bojin MF, Saffery R, Paunescu V, Tatu CA. Differential methylation pattern of xenobiotic metabolizing genes and susceptibility to Balkan endemic nephropathy, in a cohort of Romanian patients. *J Nephrol.*, 2020; 33(1): 91-100.
12. Olteanu GE, Mihai IM, Bojin F, Gavriiliuc O, Paunescu V. The natural adaptive evolution of cancer: The metastatic ability of cancer cells. *Bosn J Basic Med Sci.*, 2020; 20(3): 303-309.
13. Hădărugă NG, Szakal RN, Chirilă CA, Lukinich-Gruia AT, Paunescu V, Muntean C, Rusu G, Bujancă G, Hădărugă DI. Complexation of Danube common nase (*Chondrostoma nasus* L.) oil by β -cyclodextrin and 2-hydroxypropyl- β -cyclodextrin. *Food Chemistry*, 2020; 303: 125419
14. Ordodi V, Pana AM, Dumitrel A, Hadaruga D, Tamas A, Pode V, Todea A, Paunescu V, Negru S. An Ecological Treatment Method for Ifosfamide Contaminated Waste Water Resulting from Oncological Therapy. *Studia Universitatis Babeş-Bolyai Chimia*, 2020; 65(1): 267-277.
15. Crîsnic D, Ordodi V, Hădărugă D, Todea A, Păunescu V, Negru S. Doxorubicin Depuration in Oncological Wastewaters Using an Electrochemical Method. *Revista de Chimie*, 2020; 71(3): 161-165.
16. Rusu D, Boariu M, Stratul SI, Bojin F, Paunescu V, Calniceanu H, Surlin P, Roman A, Milicescu S, Caruntu C, Didilescu A, Gaje NP, Calenic B. Interaction between a 3D collagen matrix used for periodontal soft tissue regeneration and T-lymphocytes: An in vitro pilot study. *Exp Ther Med.* 2019; 17(2):990-996.
17. Kis B, Ifrim FC, Buda V, Avram Ş, Pavel IZ, Antal D, Paunescu V, Dehelean CA, Ardelean F, Diaconeasa Z, Şoica C, Danciu C. Cannabidiol-from Plant to Human Body: A Promising Bioactive Molecule with Multi-Target Effects in Cancer. *International Journal of Molecular Sciences*, 2019; 20(23).
18. Draghia LP, Lukinich-Gruia AT, Oprean C, Paunescu V, Tatu CA. Preliminary study of soil composition from Balkan Endemic Nephropathy areas, using a GC-MS method. *Environmental Engineering and Management Journal*, 2019; 18(11): 2455-2463.
19. Pahontu E, Proks M, Shova S, Lupascu G, Ilies DC, Barbuceanu SF, Socea LI, Badea M, Paunescu V, Istrati D, Gulea A, Drăgănescu D, Pirvu CE. Synthesis, characterization, molecular docking studies and in vitro screening of new metal complexes with Schiff base as antimicrobial and antiproliferative agents. *Applied Organometallic Chemistry*, 2019; 33(11): e5185.

20. Petrescu A, Lukinich-Gruia AT, **Paunescu V**, Ilia G. A Theoretical Study of the Molecular Coupled Structures of Aristolochic Acids and Humic Acid, Potential Environmental Contaminants. *Chemistry & Biodiversity*, 2019; 16(11): e1900406
21. Petrescu A, **Paunescu V**, Ilia G. The antiviral activity and cytotoxicity of 15 natural phenolic compounds with previously demonstrated antifungal activity. *Journal of Environmental Science and Health Part B-Pesticides Food Contaminants and Agricultural Wastes*, 2019; 54(6): 498-504.
22. Iman V, Taculescu A, Dehelean C, **Paunescu V**. Magnetic Nanoparticles (MNPs) Influence on SK-BR3 Breast Cancer Cell Line - in vitro Study. *REVISTA DE CHIMIE*, 2019; 70(7): 2452-2455.
23. Proks M, Heghes A, Cheveresan A, Nita S, Voicu M, Buda V, Ionescu D, Nita L, Trandafirescu C, **Paunescu V**. Thyme Leaves Aqueous Extract and its Formulations A comparative study based on chemical structures and biological activity. *Revista de Chimie*, 2019; 70(5): 1875-1878.
24. Tuta-Sas I, Proks M, **Paunescu V**, Pinzaru I, Sas I, Coricovac D, Moacă A, Dehelean C. Thymus Vulgaris Extract Formulated as Cyclodextrin Complexes: Synthesis, Characterization, Antioxidant Activity and In Vitro Cytotoxicity Assessment. *Farmacia*, 2019; 67(3): 442-451.
25. Bonciog D, Matiu-Iovan L, Barbulescu G, Burian C, Goje D, Buica P, **Paunescu V**, Ordodi V. Modified Langendorff device for rat heart decellularization. *Fiziologia-Physiology*, 2019; 29(98): 17-20.
26. Gai E, Lungeanu D, Arghirescu S, Calma CL, **Păunescu V**. B08:01 HLA class I and class II alleles and haplotypes frequencies patients with hematological diseases in Western part of Romania. *Fiziologia-Physiology*, 2019; 29(98): 21-34.
27. Szekeley FAE, Zogorean R, Anghel S, Gavriiliuc O, Bojin F, **Paunescu V**. CAR-T cells therapy versus TILs therapy: the future of cancer immunotherapy. *Fiziologia-Physiology* 2018; Vol. 28, No. 1(95): 4-15.
28. Zogorean R, Gavriiliuc O, Bojin F, **Paunescu V**. Real-time imaging of NK-92 cells interaction with tumoral cell lines. *Fiziologia-Physiology* 2018; Vol. 28, No. 2(96): 4-9
29. Popa L, Crisnic D, Nistor D, Plesca D, Tatu C, Tanasie G, Zogorean R, Gavriiliuc O, Anghel S, Bojin F, **Paunescu V**. Modern application of Next-Generation Sequencing (NGS). *Fiziologia-Physiology* 2019; Vol. 29, No. 2(98): 9-16.
30. Plesca D, Crisnic D, Nistor D, Tatu C, Tanasie G, Zogorean R, Anghel S, Gavriiliuc O, Bojin F, **Paunescu V**. *Fiziologia-Physiology* 2019; Vol. 29, No. 2(98): 38-43.
31. Barbulescu G, Bojin F, Ordodi V, Anghel S, Gavriiliuc O, **Paunescu V**. Human induced pluripotent stem cells-derived cardiomyocytes for cardiac applications. *Fiziologia-Physiology* 2019; 29(97): 5-13.
32. Danciu C, Zupko I, Bor A, Schwiebs A, Radeke H, Hancianu M, Cioanca O, Alexa E, Oprean C, Bojin F, Soica C, **Paunescu V**, Dehelean CA. Botanical Therapeutics: Phytochemical Screening and Biological Assessment of Chamomile, Parsley and Celery Extracts against A375 Human Melanoma and Dendritic Cells. *Int J Mol Sci.*, 2018; 19(11): E3624.
33. Oprean C, Ivan A, Bojin F, Cristea M, Soica C, Drăghia L, Caunii A, **Paunescu V**, Tatu C. Selective in vitro anti-melanoma activity of ursolic and oleanolic acids. *Toxicol Mech Methods*, 2018;28(2): 148-156.
34. Proks M, Borcan F, Cheveresan A, Pinzaru I, Guta BA, Coricovac D, **Paunescu V**, Lazureanu V. Study on the Release and Bioevaluations of Green Silver Nanoparticles Entrapped Inside Polymer-based Nanovesicles. *Materiale Plastice*, 2018; 55(4): 696-699.
35. Gruia AT, Oprean C, Ivan A, Cean A, Cristea M, Draghia L, Damiescu R, Pavlovic NM, **Paunescu V**, Tatu CA. Balkan endemic nephropathy and aristolochic acid I: an investigation into the role of soil and soil organic matter contamination, as a potential natural exposure pathway. *Environmental Geochemistry and Health* 2018; 40(4): 1437-1448.
36. Nagib R, Zogorean R, Gavriiliuc OI, Szuhaneck C, Moldoveanu B, Negrutiu ML, Sinescu C, Paunescu V, Brad S. Cytotoxicity Assessment of Metal and 3D Printed Resin Orthodontic Attachments An in vitro cell culture behavior study. *Revista de Chimie* 2018; 69(6): 1515-1518.
37. Danciu C, Bojin F, Ambrus R, Muntean D, Soica C, **Paunescu V**, Cristea M, Pinzaru I, Dehelean C. Physico-chemical and Biological Evaluation of Flavonols: Fisetin, Quercetin and Kaempferol Alone and Incorporated in beta Cyclodextrins. *Anti-Cancer Agents in Medicinal Chemistry*, 2017; 17(4): 615-626.
38. Caunii A, Oprean C, Cristea M, Ivan A, Danciu C, Tatu C, **Paunescu V**, Marti D, Tzanakakis G, Spandidos D, Tsatsakis A, Susan R, Soica C, Avram S, Dehelean C. Effects of ursolic and oleanolic on SK-MEL-2 melanoma cells: In vitro and in vivo assays. *International Journal of Oncology* 2017; 51(6): 1651-1660.
39. Pahontu E, Ilies DC, Shova S, Oprean C, **Paunescu V**, Olaru OT, Radulescu FS, Gulea A, Rosu T, Draganescu D. Synthesis, Characterization, Antimicrobial and Antiproliferative Activity Evaluation of Cu(II), Co(II), Zn(II), Ni(II) and Pt(II) Complexes with Isoniazid-Derived Compound. *Molecules* 2017; 22(4).
40. Pahontu E, Parashivescu C, Ilies DC, Poirier D, Oprean C, **Paunescu V**, Gulea A, Rosu T, Bratu O. Synthesis and Characterization of Novel Cu(II), Pd(II) and Pt(II) Complexes with 8-Ethyl-2-hydroxytricyclo(7.3.1.0(2,7))tridecan-13-one-thiosemicarbazone: Antimicrobial and in Vitro Antiproliferative Activity. *Molecules* 2016; 21(5): 674.

41. Unlusayin M, Hadaruga NG, Rusu G, Gruia AT, **Paunescu V**, Hadaruga DI. Nano-encapsulation competitiveness of omega-3 fatty acids and correlations of thermal analysis and Karl Fischer water titration for European anchovy (*Engraulis encrasicolus* L.) oil/beta-cyclodextrin complexes. *LWT-Food Science and Technology* 2016; 68: 135-144.
42. Oprean C, Zambori C, Borcan F, Soica C, Zupko I, Minorics R, Bojin F, Ambrus R, Muntean D, Danciu C, Pinzaru IA, Dehelean C, **Paunescu V**, Tanasie G. Anti-proliferative and antibacterial in vitro evaluation of the polyurethane nanostructures incorporating pentacyclic triterpenes. *Pharm Biol.*, 2016; 9: 1-9.
43. Anastasiu DM, Cean A, Bojin MF, Gluhovschi A, Panaitescu C, **Paunescu V**, Tănăsie G. Explants-isolated human placenta and umbilical cord cells share characteristics of both epithelial and mesenchymal stem cells. *Rom J Morphol Embryol.* 2016;57(2):383-90.
44. Oprean C, Mioc M, Csányi E, Ambrus R, Bojin F, Tatu C, Cristea M, Ivan A, Danciu C, Dehelean C, **Paunescu V**, Soica C. Improvement of ursolic and oleanolic acids' antitumor activity by complexation with hydrophilic cyclodextrins. *Biomed Pharmacother.* 2016 Oct; 83:1095-1104.
45. Rusu D, Calenic B, Greabu M, KraleV A, Boariu M, Bojin F, Anghel S, **Paunescu V**, Vela O, Calniceanu H, Stratul SI, Evaluation of keratinocyte progenitor and T-lymphocyte cells response during early healing after augmentation of keratinized gingiva with 3D collagen matrix – a pilot study. *BMC Oral Health*, 2016.

