# Gregory V Goldmacher, MD, PhD, MBA

## SUMMARY

Physician, scientist, and executive experienced in clinical development, medical imaging, and biomarker applications. In addition to formal training in finance (during MBA) and strategy (business leadership programs for emerging leaders), now actively expanding experience in corporate development and strategic investment.

## EXPERIENCE

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| 2019 – present | **Executive Director, Translational Biomarkers; Head of Clinical Imaging** |
| 2017 – 2019 | **Executive Director, Translational Biomarkers** |
| 2015 – 2017 | **Senior Director, Translational Biomarkers** |

**Merck & Co., Boston, MA (remote)**

- Medical, scientific, and operational leadership for imaging and clinical biomarker-based endpoint assessments in clinical development, leading a team of 10 physicians and scientists; responsible for 170+ clinical trials in phases I-IV; support regulatory agency filings, meetings, and inspections
- Immunotherapy and targeted therapy focus in oncology, including hematological, gastrointestinal, genitourinary, gynecological, breast, lung, melanoma, head/neck, and brain malignancies; also responsible for CNS, cardiovascular, endocrine, and infectious disease trial imaging for efficacy and safety assessments
- Oversee outsourcing of independent central review (approximately $45M/year), vendor relationship management and quality monitoring
- Support business development and licensing in due diligence on therapeutic assets (successful deals include Viralytics [$390M], Immune Design [$300M], Peloton Therapeutics [$2.2B], ArQule [$2.7B], Seattle Genetics [$1.6B], VelosBio [$2.7B]), and commercial partnerships on artificial intelligence and novel biomarker research
- Support Merck GHI Venture Fund in evaluating technology for strategic investments
- Lead (matrix) a multidisciplinary team (~20 members) in artificial intelligence in imaging and biomarker research
- Oversee operational improvement initiatives with departments across the organization (data management, statistics, clinical science, study management, field operations, and others)
- Develop training for internal and external teams on clinical trial endpoints, imaging, and data management; led departmental scientific meeting program, helping scientists develop communication and presentation skills
- Member of Therapeutic Area Standards Team (internal), Core Oncology Protocol team (internal), Clinical Data Interchange Standards Consortium (CDISC) Oncology Expert Group and Submission Data Standards team (national)

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| 2013 – 2015 | **Senior Director, Medical and Scientific Affairs; Head of Oncology Imaging** |
| 2012 – 2013 | **Director, Medical and Scientific Affairs; Head of Oncology Imaging** |
| 2011 – 2012 | **Associate Director, Medical and Scientific Affairs** |
| 2010 – 2011 | **Assistant Director, Medical and Scientific Affairs** |

**ICON Clinical Research, Warrington, PA**

- Medical, scientific, and regulatory leadership on independent endpoint assessment for over 110 clinical trials, focused on oncology, but included CNS, cardiovascular, rheumatology, infectious disease, and diagnostic agent development
- Developed trial protocols, imaging charters, and other trial documents; guided and supported clinical operations during study startup and execution
- Sales, business development, and marketing support on proposals, bid defenses, webinars, industry presentations and training for sales teams; built relationships with key opinion leaders and strategic clients
- Wrote journal articles, guidance documents, educational, and marketing materials, and led publication strategy
- Ran internal research projects, published and presented in commercial and academic settings
- Performed independent review, using RECIST, RANO, Cheson, volumetrics, and other criteria
- Travelled globally to train independent readers, site physicians, and study staff; created courses on clinical development for internal staff and sponsor teams
- Responsible for up to 60 projects at a time, leading teams of up to 10 per project (matrix), and received direct reports
- 10% effort spent maintaining and developing clinical experience in nuclear medicine, including PET and nuclear cardiology, under direction of faculty at Temple University Hospital
- Onboarded new physicians, participated in company-wide quality and process improvement programs

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| 2009 – 2010 | **Postdoctoral Fellow** |

**Jefferson Hospital for Neuroscience, Philadelphia, PA**

- Research on stem cell therapy for ischemic stroke, using small animal surgery and imaging
- Wrote regulatory protocols, academic manuscripts, and patent documentation

**2008 – 2009**        **Radiology Resident**
**Hahnemann University Hospital, Philadelphia, PA**
- Clinical training in diagnostic and interventional radiology

**2006 – 2008**        **Neuroradiology Clinical Research Fellow**
**Massachusetts General Hospital, Boston, MA**
- Physician co-investigator and research manager for NIH-funded research projects on advanced stroke imaging
- Trained staff for clinical trial roles; supervised screening and trial enrollment; designed case report forms; collaborated with IT on data flow; evaluated adverse events; analyzed data using imaging and statistical software
- Developed a stroke imaging case database for prospective and retrospective analyses
- Participated in development and early testing of a novel diagnostic device (Electrical Impedance Spectroscopy), including grant applications, IRB approval, instrument design, prototype construction, and early clinical testing
- Ran imaging core lab for industry-sponsored phase 2A trial: data quality and site protocol compliance, CRF design and implementation, ran independent review and prepared reports for lead investigators and sponsor
- Presented reports at national conferences; wrote grant proposals, IRB protocols, and manuscripts

**2002 – 2006**        **Radiology Resident**
**Baystate Medical Center, Springfield, MA**
- Clinical training in diagnostic and interventional radiology
- Junior Chief Resident, 2004; served on Radiology Performance Improvement Committee, Education and Research Committee, Residency Admissions Committee

**2001 – 2002    Preliminary Year Resident**
**Newton-Wellesley Hospital, Newton, MA**
- Clinical training in internal medicine and general surgery
- Served on Information Systems Physician Advisory Committee

**1993 – 2004    Instructor and Master Trainer**
**The Princeton Review, Dallas, TX and Boston, MA**
- Taught courses and trained teachers in SAT, MCAT, USMLE Step I
- Site manager and training administrator for numerous courses and training events
- Wrote and edited MCAT and USMLE Step I materials, participated in course development and marketing

**EDUCATION**

**M.B.A.**                **2015**                **Business Management**
Fox School of Business, Temple University, Philadelphia, PA

**M.D.**                **2001**                **Medicine**
University of Texas Southwestern Medical School, Dallas, TX

**Ph.D.**                **2001**                **Neuroscience**
University of Texas Southwestern Graduate School of Biomedical Sciences, Dallas, TX

**B.A.**                **1993**                **Biological Sciences**
University of Chicago, Chicago, IL

**EXAMINATIONS AND LICENSURE**
- Passed United States Medical License Examinations Steps I, II, and III
- Passed American Board of Radiology Physics and Clinical Examinations
- Medical License: Massachusetts #233176

**HONORS AND AWARDS**
- Merck Impact Award, 2020 (driving results in due diligence for M&A)
- Merck Excel Award, 2020 (driving results in due diligence for M&A)
- Four Merck Applause Awards and one Achieve Award, 2020 (guidance for business continuity during COVID-19)
- Merck Excel Award, 2020 (driving results in due diligence for M&A)
- Merck Excel Award, 2019 (driving results in a regulatory submission)
- Merck Applause Award, 2019 (educating statistics group on novel response criteria)
- Merck Impact Award, 2019 (driving results in due diligence for M&A)
- Merck Celebrate Award, 2019 (collaboration and education in biomarker research)
- Merck Achieve Award, 2019 (driving results in due diligence for M&A)
- Merck Impact Award, 2018 (driving results in clinical development)
- Merck Achieve Award, 2018 (making rapid disciplined decisions in business development)
- Merck Enterprise Leadership Program at Harvard Business School 2018
- Merck Excel Award, 2018 (driving results while leading departmental scientific programs)
- Merck Impact Award, 2018 (making rapid disciplined decisions in due diligence for M&A)
- Merck Celebrate Award, 2018 (fostering collaboration with clinical operations and trial management)
- Merck Special Achievement Award, 2016 (outstanding support during FDA inspection)
- Dean's Certificate of Excellence 2015, Fox School of Business
- ICON Executive Leadership program at Smurfit Business School, University College, Dublin, 2014
- Wunsch Foundation Award (for achievement in Operations Management), 2013, Fox School of Business
- Armed Forces Institute of Pathology Best Case Award 2005
- Amersham Fellow Reporter Award for the Society of Computed Body Tomography/Magnetic Resonance, 2004
- Association of Chemoreception Sciences Award, 1997, 1998
- Medical Scientist Training Program Fellowship, 1993-2001
- Manaster-Solomon Academic Honor Scholarship, 1989-1993


**PROFESSIONAL ASSOCIATIONS AND COLLABORATIVE GROUPS**
- Pharma Imaging Network for Therapeutics And Diagnostics (PINTAD)
  - Steering Committee from 2020-present
  - PRoLoG Committee – Standardization of lymphoma assessment
- Clinical Data Interchange Standard Consortium
  - Submission Data Standards committee
- Project Datasphere
  - Steering Committee on AI automation of oncology response assessment
  - Task Force on Images and Algorithms
- Radiological Society of North America
  - 2012-2018 Quantitative Imaging Biomarkers Alliance (QIBA) leadership
    - Collaboration of academic, industry, and regulatory leaders, aimed at developing and qualifying imaging biomarkers for patient care and clinical trials
    - Co-chair of tumor volumetry committee, co-chair of CT modality committee, member of steering committee, liaison to sustainability task force, industry representative to FDA on tumor volume biomarker qualification
    - Worked with thought leaders from across the world; led projects and set group priorities, allocated grant funding, aided in commercialization efforts
    - Drove complex projects with a diverse team, requiring people management and executive soft skills
- American Society of Clinical Oncology
  - Technology Research Group
- American College of Radiology

## PUBLICATIONS AND PRESENTATIONS

### Peer-Reviewed Papers

Chen Y, Ou W, Roberts CS, Petigara T, Goldmacher GV, Fancourt N, Prosperi C, Knoll MD. Deep Learning for Classification of Pediatric Chest Radiographs by WHO's Standardized Methodology. Submitted to *Clin Infectious Disease*.

Ahmed F, Dercle L, Goldmacher GV, Yang H, Connors D, Tang Y, Karovic S, Zhao B, Maitland M, Oxnard G, Schwartz L. Comparing RECIST 1.1 and iRECIST in Advanced Melanoma Patients Treated with pembrolizumab in a Phase II Clinical Trial. 2020 *European Radiology*. https://link.springer.com/article/10.1007/s00330-020-07249-y

Goldmacher GV, Khilnani AD, Andtbacka RHI, Luke JJ, Hodi SF, Marabelle A, Harrington K, Perrone A, Tse A, Madoff DC, Schwartz LH. Response criteria for intratumoral immunotherapy in solid tumors: itRECIST. 2020 *Journal of Clinical Oncology*. https://ascopubs.org/doi/abs/10.1200/JCO.19.02985

Athelogou M, Kim HJ, Dima A, Obuchowski N, Peskin A, Gavrielides MA, Petrick N, Saiprasad G, Colditz D, Beaumont H, Oubel E, Tan Y, Zhao B, Kuhnigk J, Moltz JH, Orieux G, Gillies RJ, Gu Y, Mantri N, Goldmacher G, Zhang L, Vega E, Bloom M, Jarecha R, Soza G, Tietjen C, Takeguchi T, Yamagata H, Peterson S, Masoud O, Buckler AJ. Algorithm Variability in the Estimation of Lung Nodule Volume From Phantom CT Scans: Results of the QIBA 3A Public Challenge. *Acad Radiol.*, 2016: 23: 940-952.

Goldmacher GV, Ellingson BM, Boxerman J, Barboriak D, Pope WB, Gilbert M. Standardized Brain Tumor Imaging Protocol For Clinical Trials. *AJNR Am. J. Neuroradiol.*, 2015. 36(10):E65-6. doi: 10.3174/ajnr.A4544..

Ellingson BM, Bendszus M, Boxerman J, Barboriak D, Erickson BJ, Smits M, Nelson SJ, Gerstner E, Alexander B, Goldmacher G, Wick W, Vogelbaum M, Weller M, Galanis E, Kalpathy-Cramer J, Shankar L, Jacobs P, Pope WB, Yang D, Chung C, Knopp MV, Cha S, van den Dent MJ, Chang S, Yung WKA, Cloughesy TF, Wen PY, Gilbert MR. Consensus Recommendations for a Standardized Brain Tumor Imaging Protocol (BTIP) in Clinical Trials. *Neuro-Oncology*. 2015 Epub ahead of print Aug 5 2015. doi:10.1093/neuonc/nov095

Goldmacher GV and Raunig D. The imaging core lab perspective on glioblastoma imaging and response assessment in clinical trials. *Neuro-Oncology* 2014 16 (10): vii48-vii50 doi: 10.1093/neuonc/nou225

González RG, Furie KL, Goldmacher GV, Smith WS, Kamalian S, Payabvash S, Harris GJ, Halpern EF, Koroshetz WJ, Camargo ECS, Dillon WP, and Lev MH. Good Outcome Rate of 35% in IV-tPA - Treated Patients With Computed Tomography Angiography Confirmed Severe Anterior Circulation Occlusive Stroke. *Stroke* 2013; http://stroke.ahajournals.org/content/early/2013/09/03/STROKEAHA.113.001938

Raunig D, Goldmacher G, Conklin J. Local Evaluation and Blinded Central Review Comparison: A Victim of Meta-Analysis Shortcomings. *Therap Innov & Regul Sci.* 2013; doi:10.1177/2168479013499572

Goldmacher GV, Nasser R, Lee DY, Yigit S, Rosenwasser R, Iacovitti L. Tracking Transplanted Bone Marrow Stem Cells and Their Effects in the Rat MCAO Stroke Model. *PLoS ONE* 2013; 8(3): e60049. doi:10.1371/journal.pone.0060049

Goldmacher GV and Conklin, J. The use of CT and MR tumour volumetrics in determining response to therapy in anti-cancer clinical trials. *Brit J Clin Pharmacol* 2012; 73(6): 846-854.

González RG, Lev MH, Goldmacher GV, Smith W, Harris G, Halpern EF, Koroshetz WJ, Camargo E, Dillon W, Furie KL. Improved Prediction of Ischemic Stroke Outcomes by Combining CT Angiography with Neurological Evaluation. *PLoS ONE*. 2012 Jan; 7(1): e30352.

Kamalian S, Kamalian S, Maas MB, Goldmacher GV, Payabvash S, Akbar A, Schaefer PW, Furie KL, Gonzalez RG, Lev MH. CT Cerebral Blood Flow Maps Optimally Correlate With Admission Diffusion-Weighted Imaging in Acute Stroke but Thresholds Vary by Postprocessing Platform. *Stroke*. 2011; 42(7): 1923-8.

Bonmassar G, Iwaki S, Goldmakher GV, Angelone L, Belliveau JW, Lev MH. On the Measurement of Electrical Impedance Spectroscopy (EIS) of the Human Head. *Int J Bioelectromagn*. 2010; 1;12(1): 32-46.

Ferreira RM, Lev MH, Goldmakher GV, Kamalian S, Schaefer PW, Furie K, Gonzalez RG, Sanelli PC. Arterial Input Function Placement for Accurate CTP Map Construction in Acute Stroke. *AJR Am J Roentgenol*. 2010; 194: 1330-6.

Lima F, Goldmakher GV, Lev MH, Furie KL. Computed tomography. *Front Neurol Neurosci*. 2009; 25: 193-6.

Konstas AA, Goldmakher GV, Lee T-Y, and Lev MH. Theoretic Basis and Technical Implementations of CT Perfusion in Acute Ischemic Stroke, Part 1: Theoretical Basis. *AJNR Am. J. Neuroradiol.*, 2009; 30: 662-668.

Konstas AA, Goldmakher GV, Lee T-Y, and Lev MH. Theoretic Basis and Technical Implementations of CT Perfusion in Acute Ischemic Stroke, Part 2: Technical Implementations. *AJNR Am. J. Neuroradiol.*, 2009; 30: 885 - 892.

<u>Goldmakher</u> GV, Camargo EC, Furie KL, Smith WS, Harris GJ, Chou MJ, Roccatagliata L, Halpern EF, Dillon WP, Gonzalez RG, Singhal AB, Koroshetz WJ, Lev MH.  Hyperdense Basilar Artery Sign on Unenhanced CT Predicts Thrombus and Outcome in Acute Posterior Circulation Stroke. *Stroke* 2009; 40; 134-139.

Wintermark M, Albers G, Alger JR, Bammer R, Demaerschalk BM, Derdeyn CP, Eastwood JD, Fiebach J, Fisher M, Furie KL, <u>Goldmakher</u> GV, Hacke W, Kidwell CS, Kloska SP, Koroshetz WJ, Lee TY, Lev MH, Provenzale J, Sorensen AG, Wardlaw J, Warach S, Wu O. Acute Stroke Imaging Consortium Roadmap. *AJNR Am. J. Neuroradiol*., 2008; 29: e23-e30.

Wintermark M, Albers G, Alger JR, Bammer R, Demaerschalk BM, Derdeyn CP, Eastwood JD, Fiebach J, Fisher M, Furie KL, <u>Goldmakher</u> GV, Hacke W, Kidwell CS, Kloska SP, Koroshetz WJ, Lee TY, Lev MH, Provenzale J, Sorensen AG, Wardlaw J, Warach S, Wu O. Acute Stroke Imaging Consortium Roadmap. *Stroke*. 2008; 39: 1621-8.

Jaff MR, <u>Goldmakher</u> GV, Lev MH, Romero JM. Imaging of the carotid arteries: the role of duplex ultrasonography, magnetic resonance arteriography, and computerized tomographic arteriography. *Vasc Med*. 2008; 13 (4): 281-92.

<u>Goldmakher</u> GV, Lee S, Coughlin B. Mature cystic teratoma (dermoid) of the mesentery. *Appl Radiol* 2005; 34: 41-3.

<u>Goldmakher</u> GV. Use of multidetector computed tomography in the evaluation of spinal trauma. Proceedings from the SCBT/MR, *Applied Radiology*, supplement September 2004.

<u>Goldmakher</u> GV, Moss RL. A Subset Of Periglomerular Neurons In The Rat Accessory Olfactory Bulb May Be Excited By GABA Through A Na+-Dependent Mechanism. *Brain Research* 2000; 871(1):7-15.


## Abstracts and Presentations

<u>Goldmacher GV</u>, Khilnani AD, Andtbacka RHI, Luke JJ, Hodi SF, Marabelle A, Harrington K, Perrone A, Tse A, Madoff DC, Schwartz LH. Response criteria for intratumoral immunotherapy in solid tumors: itRECIST. Accepted for poster presentation at ASCO 2020.

Chen A, Saouaf J, Zhou B, Crawford R, Yuan J, Ma J, Baumgartner R, Wang S, <u>Goldmacher G</u>. A Deep Learning-facilitated Radiomics Solution for the Prediction of Lung Lesion Shrinkage in Non-Small Cell Lung Cancer Trial. Presented at the IEEE International Symposium on Biomedical Imaging, 2020.

Edeline J, Karwal M, Zhu AX, Finn RS, Cattan S, Ogasawara S, Verslype C, Dadduzio V, Fartoux L, Vogel A,  Rosmorduc O, Verset G, Chan SL, Knox J, Daniele B, Cheng AL, <u>Goldmacher G</u>, Jensen E, Siegel AB, Kudo M. RECIST Version 1.1 and irRECIST Outcomes in Advanced HCC Treated With Pembrolizumab in the KEYNOTE-224 and KEYNOTE-240 Studies. Presented at ASCO GI 2019.

Chen X, Liu H, <u>Goldmacher G</u>, Roberts CS, Maria DK, Ou W. Pediatric Bacterial Pneumonia Classification Through Chest X-rays Using Transfer Learning.  Presented at the International Society for Pharmacoeconomics and Outcomes Research (ISPOR) annual meeting, 2019.

Chen A, Crawford R, <u>Goldmacher GV</u>, Dogdas B. A Progressively-trained Scale-invariant and Boundary-aware Deep Neural Network for the Automatic 3D Segmentation of Lung Lesions. Presented at IEEE Winter conference on Applications of Computer Vision (WACV), 2019.

Moskowitz CH, Chen, RW, Armand, P, Zinzani PL, Vassilakopoulos TP, <u>Goldmacher GV</u>, Lin J, Nahar A, Balakumaran A Salles G. Pembrolizumab Antitumor Activity in Relapsed/Refractory Classical Hodgkin Lymphoma in KEYNOTE-087: Assessment of Response by Revised Response Criteria for Malignant Lymphoma 2007 Versus Lugano 2014 Classification. Presented at the American Society of Hematology Annual Meeting, Atlanta, GA 2017

<u>Goldmacher</u> GV, A Quantified Picture is Worth a Thousand Words: Generating Efficient Signals of Efficacy. Presented at the DIA Annual Meeting, Washington DC 2015

<u>Goldmacher</u> GV, Mantri N, Conklin JJ, Raunig D. Rates and causes of radiologist disagreement during independent review of oncology clinical trials. Presented at the RSNA Annual Meeting, Chicago 2014.

Raunig J, Mantri N, <u>Goldmacher</u> GV, Raunig D. Diffusion tensor imaging detection of cognitive changes in early amnestic MCI. Presented at Alzheimer's Association International Conference. Copenhagen 2014.

<u>Goldmacher</u> GV, Armato S, Athelogou M, Buckler A, Petrick, N, Zhao B, Schwartz L. 2013 Report from the Volumetric CT Technical Committee of the Quantitative Imaging Biomarkers Alliance. Presented at the RSNA Annual Meeting. Chicago 2013.

Raunig D, <u>Goldmacher</u> GV, Conklin JJ. Adjudication rate is a poor indicator of read quality in clinical trials using progression-related endpoints assessed by imaging. Published in conference proceedings for the American Society of Clinical Oncology. Chicago 2012.

<u>Goldmacher</u> GV. CT and MR volumetric analysis of tumour response. Presented at the British Pharmacological Society Annual Meeting, London, 2010.

Goldmakher GV, Camargo EC, Furie KL, Smith WS, Harris GJ, Chou MJ, Roccatagliata L, Halpern EF, Dillon WP, Gonzalez RG, Singhal AB, Koroshetz WJ, Lev MH. Hyperdense Basilar Artery Sign on Unenhanced CT Predicts Thrombus and Outcome in Acute Posterior Circulation Stroke. Presented at AHA International Stroke Conference, New Orleans, 2008.

Ferreira RM, Goldmakher GV, Kamalian S, Schaeffer PW, Gonzalez RG, Lev MH. Accurate Quantitative CTP Map Construction in Acute Stroke Patients with unilateral MCA Thrombus: Use the Left or Use the Right, But Don't Place the Arterial Input Function ROI Distal to the Occlusion. Presented at AHA International Stroke Conference, New Orleans, 2008. Abstract. Stroke. 2008; 39:527-729.

Velayudhan V, Chu P, Lev S, Kamalian S, Goldmakher GV. Application of CT Perfusion in Determining Salvageable Ischemic Penumbra in Patients Presenting with Acute Stroke. Poster presentation, Radiological Society of North America Annual Meeting, Chicago, IL, 2007.

Kamalian S, Schaefer PW, Barak ER, Tang-Quan KR, Goldmakher GV, Koroshetz WJ, Gonzalez RG, Lev MH. Relative – Not Absolute! – CT cerebral blood volume (CBV) thresholds are highly correlated with MR diffusion-weighted imaging (DWI) determination of acute infarct "core". Presented at the International Stroke Conference, San Francisco, CA, February 2007.

Goldmakher GV, Kamalian S, Schaefer PW, Joshi M, Harris GJ, Lev MH. Hot Topic: Fully Automated Processing of Stroke CT Perfusion Maps is Fast and Accurate. Presented at the Radiological Society of North America annual meeting, 2006.

Goldmakher GV, Madan N, Kamalian S, Schaefer PW, Gonzalez RG, Lev MH. Hot Topic: Axial "Shuttle Mode" CT Perfusion Acquisition Increases Coverage and Decreases Radiation and Contrast Dose Without Loss of Visual Diagnostic Accuracy. Presented at the Radiological Society of North America annual meeting, 2006.

Goldmakher GV, Moss RL. Some periglomerular cells of the rat accessory olfactory bulb may be excited by GABA. Presented at the 21st Annual National Meeting of the Association for Chemoreception Sciences, Sarasota, FL, April 1999.

Goldmakher GV. Characterization of the patch-clamp properties of mitral and periglomerular cells in the accessory olfactory bulb of the rat, Rattus norvegicus. Presented at the 20th Annual National Meeting of the Association for Chemoreception Sciences, Sarasota, FL, April 1998.

Moss RL, Shi J, Shen X-M, Goldmakher GV. Nasal mucus potentiates the ability of vomeronasal chemosensory ligands to decrease new membrane conductance. 26th Annual Meeting of the Society for Neuroscience, Washington, D.C., November, 1996.


## Patents

Zhou, Bo; Chen, Antong; Goldmacher, Gregory. 2019. Title: A progressively trained scale-invariant and boundary-aware deep neural network for the automatic 3D segmentation of lesions. U.S. Application No. 62/889,463, Filed August 20, 2019. Patent Pending.


## Industry publications

Raunig D, Goldmacher, GV, Owens, S. Made to Measure. European Biopharmaceutical Review. 2014 October

Goldmacher GV, Raunig D, Conklin J. Future Vision. European Biopharmaceutical Contractor, 2013 Spring.

Goldmacher GV. A new approach to assessing progression-free survival. CenterWatch Monthly. 2013 Jan

Goldmacher GV. Decentralization of imaging: benefits and caveats for sponsors. Contract Pharma. 2012 Nov/Dec.

Goldmacher GV. Reviewing for eligibility. European Biopharmaceutical Review. 2010 Autumn.


## Other activities

Temple Innovation and Entrepreneurship Institute – 2020 Idea competition reviewer and business mentor

Immuno-Oncology 360 2020 Annual Meeting – Panelist

FDA Project Datasphere Symposium VIII, 2019 – Faculty presenter

FNIH Cancer Biomarkers Consortium 2019 – Presenter

Immuno-Oncology 360 2018 Annual Meeting – Panelist

Radiological Society of North America 2017 Annual Meeting – QIBA Special Session – Course presenter and panelist

CBI 2017 Imaging In Clinical Trials Meeting – Conference chair, panelist, and presenter

Imaging in Therapeutic and Diagnostic Agent Development. Refresher course at the RSNA Annual Meeting, Chicago 2014. Course organizer and lecturer.

Created RECIST 1.1 and iRECIST training now used industry-wide through the Transcelerate collaboration and the Society of Clinical Research Sites (https://myscrs.org/learning-campus/merck-irecist-modules/)