

Jerry (Gerald) Sedgewick

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Imaging and Quantitation Consultant and Author

Jerry Sedgewick provides a range of services for instituting image integrity, consistency, efficiency, and quantitation-ready images. He can solve imaging problems others can't because he has deep knowledge in the entire imaging workflow, and not just one part of it. That includes:

- ✓ Lighting of samples
- ✓ Acquisition with Camera | Imaging equipment (micro, macro, fluorescent, brightfield, difficult to image materials)
- ✓ Post-Processing
- ✓ Quantitation (image analysis | stereology)
- ✓ Data presentation

His services have assisted companies (see below) in development and marketing of imaging products, improved consistent imaging for identical contrast and color from several imaging stations, solved imaging problems due to glare and reflective surfaces, provided quantitative data from computer aided image analysis for companies that have subsequently received FDA approval, and led to dozens of novel quantitative methods for images from several disciplines (ophthamology, nueroscience, materials science, biology, dermatology, etc.)

Employment/Education:

1998 – Present: Owner, Sedgewick Initiatives/Imaging and Analysis, Scientific Consultation, Training and Tools for Scientific Imaging.

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| 2015 - Present | Retail Packaging Matters , Minneapolis, MN Technical Consultant. Optimizing light path, optics and polarity of hand held device. |
| 2014 - 2015 | Foley Lardner, LLP, Boston, MA . Acted as image integrity expert witness for law firm's client in a scientific misconduct case. |
| 2013-2015 | Datacolor , Lawrenceville, NJ. Technical Consultant. Assisted in developing new product and taking it to the microscopy market. Provided auto-white balancing software routine that outperforms Photoshop auto-functions, technical assistance at trade shows, vision for market acceptance and use, beta testing, white papers, articles in non-juried journals, manuscript currently in submission to a juried journal (October, 2014), sales materials, blogs, and "industry |

- expert” webinars.
- 2014-
Present **Afton Chemical**, Richmond, VA. Provided workflow to calibrate images of metal (copper) to a uniform standard so that images from several locations and cameras produced similar colors. Images are used to document and potentially validate ANSI classifications.
- 2014-
Present **Dr. Ed Ryan**, Ophthalmologist, Saint Paul, MN. Developed quantitative method for measuring detritus in vitreous of eye.
- 2001 –
Present **Microscopy. Marketing and Education**, McKinney, Texas. Consult with MME to assist with development and support of new products entering the microscopy market; and with assessment of trends in the microscope market.
- 2012-
2013 **RQMIS**, Newburyport, MA. Technical Writer/Consultant (January 2012 – December 2013). Completed entire manual, documents and forms for 13485 quality documents and European Medical Device (Chinese/German company, Bonovo Orthopedics), audited medical device company, updated quality documentation, and advised QA staff. Completed web page with Flash/3D animation for RQMIS.
- 2009/2013 **St. Jude Medical**, Minneapolis, MN (2009). Developed imaging method using Second Harmonic Generation (SHG) from custom built device to image collagen in heart slices. Developed machine vision method for measuring crossings in stents, along with instrumentation, for a sevenfold improvement in accuracy.
- 2007 -
2012 **Angioslide**, Tel Aviv, Israel. Developed, implemented and provided services for collecting data from human samples (embolic material from vessel walls as a result of angioplasty): provided image analysis, and completed reports for subsequent inclusion in FDA approval process. Good Laboratory Practices (GLP) was implemented as part of data collection. Data analysis portion given to FDA was immediately approved for their embolic device.
- 2010 -
2012 **Oriel Stat A Matrix**, Edison, NJ. Developed regulatory documentation for Fortune 500 company for ISO 9001:2008, and for medical device companies for EU 13485 compliance, and for FDA 21 CFR Part 820 compliance. Included auditing.
- 2010 -
2012 **Neurovision**, Sacramento, CA. Developed method for measuring optical intensity of labeled lesions in the fundus of the eye, and performed quantitative analysis on human fundus images for pilot studies. Created Flash animation for fundraising and marketing purposes.
- 2009 -
2010 **Quantum Catch**, LLC, Prescott, AZ. Director of Image Analysis. Included creation of stand alone software to identify and measure lesions associated with diabetic retinopathy and age-related macular degeneration, and then to grade the severity of the condition and recommend (or not) treatment. Software provided means for computer assisted diagnosis in remote areas where doctors are largely unavailable for the two leading causes of blindness in which lesions are asymptomatic.

- 2009 **Boston Scientific**, Minneapolis, MN. Developed microscopy method for analysis of large samples (stents); created automated means for visualizing and measuring image features labeled with fluorescent markers on a confocal.
- 2009 **EcoLab**, Minneapolis, MN. Trained engineers in lighting and photographic methods for obtaining images from which objective measurements could be made for Quality Assurance (QA). Images included glass, sprays, dyed polymers and discolored metal. Trained, as well, in use of software and statistical techniques to obtain measurements from free and commercial analysis software.
- 2006 – 2008 **Lumenbio**, Inc., Plymouth, MN. Services similar to Angioslide provided for subsequent FDA approval for Lumenbio's embolic device.
- 2003 - 2008 **Medtronic**, Minneapolis, MN. Developed automated methods for measuring from standard H&E microscope samples. Trained personnel on use of light microscopy devices and scientific cameras. Measured manufactured samples for legal purposes.
- 2003 **Hewlett-Packard** (via Microscopy, Marketing & Education), Corvallis, OR. Color & contrast correction, along with calibration methods training provided to engineering staff.
- 2001 - 2002 **Blizzard Genomics**, Minneapolis, MN (2001- 2002). Imaging Device Invention Consultation: acted as consultant for invention and development of genomics imaging device.
- 1998 **Angiogard**, Inc. (bought by Johnson & Johnson, Inc.), Plymouth, MN. Provided similar consulting services as those provided to Angioslide (above). FDA approval granted for this embolic device.

1996 – 2009: Program Director, Biomedical Image Processing Lab (BIPL), Department of Neuroscience, University of Minnesota.

- Directed, administrated, set vision and revenue goals with Neuroscience administrators for core light microscopy facility that was 90% self-supporting.
- Made purchasing decisions in light of feedback from researchers and by looking at trends in life sciences.
- Trained and supported clients and staff as best means for increasing revenue primarily in confocal use and methods for obtaining best results.
- Built a 2 photon, resonant mirror confocal from scratch, an SHG confocal using an existing head, and a novel light source that didn't bleach fluorescence.
- Sought and demonstrated new technologies to appropriate PI's and researchers.
- Provided reports to department head and dean.
- Generated use of facility with local corporations for added revenue.
- Solved problems in various areas of research (immunology, neuroscience, engineering, dentistry, dermatology, etc.)

- Immediately introduced new microscopy techniques to clients, such as TIRF, FRAP, FRET, spectral scanning & unmixing, deconvolution, 3D reconstruction, SHG, live cell imaging, stereology, etc.
- Attended workshops, conferences and meetings to learn and train in techniques.
- Created one of the largest service labs in the country with 600 clients and 13 workstations.

1985 – 1995: Principal Photographer, Department of Cell Biology and Neuroanatomy, University of Minnesota.

Performed photography services for the department, at first with film-based technology, and later with earliest digital software and technology (UNIX-based programs, Photoshop).

1983 – 1985: Gerald Sedgewick Photography, Writing and Media, St. Paul, Minnesota

Wrote scripts for videos on ISO 2000 implementation, chemical and hazardous material signage, and phone technology, and for promotional multi-media and video presentations. Engaged in commercial and editorial photography.

Clients included: 3M, Target, Campbell-Mithun (PR agency), Pillsbury, MN State Fire Fighter's Association.

1981 – 1983: Photography Technician, Department of Zoology, University of Iowa.

Performed lab functions, layout of figures and imaging for pioneer in neuronal plasticity research (Stan Kater, PhD).

1978 – 1981: Administrative Assistant, City of Flint, Flint, MI

Wrote scripts, took photographs and created multi-media presentations to promote city departments.

1973 to 1977: B.A. Journalism/English, University of Iowa

Was accepted into the internationally noted Iowa Writer's Workshop.

Books/Book Chapters:

Sedgewick, J. (2014). Using Photoshop with Images Created by a Confocal System. (Book Chapter) Confocal Microscopy, Methods and Protocols, Vol 1075, pp 97-128, Springer.

Sedgewick, J. (2011) Imaging Techniques in Signal Transduction IHC. (Book Chapter) Signal Transduction Immunohistochemistry: Methods and Protocols, Vol 717, Humana Press.

Sedgewick, J. (2010). Post-Processing Confocal Images. (Book Chapter) *Confocal Microscopy: Methods & Protocols*. Humana Press 2010.

Sedgewick, J. (2008). Scientific Imaging with Photoshop: Methods, Measurement and Output. *Peachpit Press*, Berkely, CA.

Sedgewick, J. (2007). Considerations When Altering Digital Images. *Essential Methods and Protocol*. Wiley Press.

Sedgewick, J. (2002). Quick Photoshop for Research: A Guide to Digital Imaging for Photoshop 4x, 5x, 6x, & 7x. *Kluwer Academic/Plenum Publishers*.

Selected Publications

A. T. Haase, K. Henry, M. Zupancic, **G. Sedgewick**, R. A. Faust, H. Melroe, W. Cavert, K. Gebhard, K. Staskus, Z-Q Zhang, P. J. Dailey, H. H. Balfour Jr., A. Erice, A. S. Perelson. (1996) Quantitative Image Analysis of HIV-1 Infection in Lymphoid Tissue. **Science** Vol 274: 885-1048.

G. Sedgewick, Z-Q Zhang, and N. Pham. (1996) Cover Image, **Science** Vol 274

J. Sedgewick. (1997) Cover image, **Science** Vol. 276

Z-Q Zhang, D. W. Notermans, **G. Sedgewick**, W. Cavert, S. Wietgreffe, M. Zupancic, K. Gebhard, K. Henry, L. Boies, Z. Chen, M. Jenkins, R. Mills, H. McDade, C. Goodwin, C. M. Schuwirth, S. A. Danner, A. T. Haase. (1997) Kinetics of CD4+ T Cell Repopulation of Lymphoid Tissues After Treatment of HIV-1 Infection. **Proc Natl Acad Sci U S A**. Vol 95(3): 1154-9.

Fatemi SH, Sidwell R, Kist D, Akhter P, Meltzer HY, Bailey K, Thuras P, **Sedgewick J**. (1998) Differential expression of synaptosome-associated protein 25 kDa [SNAP-25] in hippocampi of neonatal mice following exposure to human influenza virus in utero. **Brain Res**. Vol. 800(1):1-9.

Setiadi H, **Sedgewick G**, Erlandsen SL, McEver RP. (1998) Interactions of the cytoplasmic domain of P-selectin with clathrin-coated pits enhance leukocyte adhesion under flow. **J Cell Biol**. Vol. 142(3): 859-71.

Dombek PE, Cue D, **Sedgewick J**, Lam H, Ruschkowski S, Finlay BB, Cleary PP. (1999) Highfrequency intracellular invasion of epithelial cells by serotype M1 group A streptococci: M1 protein-mediated invasion and cytoskeletal rearrangements. **Mol Microbiol**. Vol. 31(3): 859-70.

Wild R, Ramakrishnan S, **Sedgewick J**, Griffioen AW. (2000) Quantitative assessment of angiogenesis and tumor vessel architecture by computer-assisted digital image analysis: effects of VEGF-toxin conjugate on tumor microvessel density. **Microvasc Res**. Vol. 59(3): 368-76.

Rudney JD, Chen R, **Sedgewick GJ**. (2001) Intracellular Actinobacillus actinomycetemcomitans and Porphyromonas gingivalis in buccal epithelial cells collected from human subjects. **Infect Immun**. Vol. 69(4): 2700-7.

Grube E, Gerckens U, Yeung AC, Rowold S, Kirchhof N, **Sedgewick J**, Yadav JS, Stertzer S. (2001) Prevention of distal embolization during coronary angioplasty in saphenous vein

grafts and native vessels using porous filter protection. **Circulation**. 2001 Vol. 104(20): 2436-41.

Fatemi SH, Earle JA, Stary JM, Lee S, **Sedgewick J**. (2001) Altered levels of the synaptosomal associated protein SNAP-25 in hippocampus of subjects with mood disorders and schizophrenia. **Clinical Neuroscience and Neuropathology**. Vol. 12(15): 3257-62.

Rudney JD, Chen R, **Sedgewick GJ**. (2005) Actinobacillus actinomycetemcomitans, Porphyromonas gingivalis, and Tannerella forsythensis are components of a polymicrobial intracellular flora within human buccal cells. J Dent Res. 2005 Jan;84(1):59-63.

Henry M, Polydorou A, Henry I, Liasis N, Polydorou A, Polydorou V, Demesticha T, Skandalakis P, Kotsiomitis E, Hugel M, **Sedgewick J**, Ruth G. (2007). New distal embolic protection device the FiberNet 3 dimensional filter: first carotid human study. Catheter Cardiovasc Interv. 2007 Jun 1;69(7):1026-35

Yokoyama Y, **Sedgewick G**, Ramakrishnan S. (2007) Endostatin binding to ovarian cancer cells inhibits peritoneal attachment and dissemination. Cancer Res. 2007 Nov 15;67(22):10813-22

Reilly C, Wietgreffe S, **Sedgewick G**, Haase A. (2007) Determination of simian immunodeficiency virus production by infected activated and resting cells. AIDS. 2007 Jan 11;21(2):163-8

Linden, M, Ericson, M, **Sedgewick, G** (2015) An innovative method for obtaining consistent images and quantification of histochemically stained specimens. Journal of Cytochemistry & Histochemistry, 2015 April 1(4): 233-243.

Selected Publications – Non-Juried

Sedgewick, J. (2002). Resolution Confusion. Microscopy Today. Vol 9 18.

Sedgewick, J. (2003). Segmentation Before Quantization By Using Photoshop: Darkfield Images. Microscopy Today. Vol. 11 Number 1: 18 - 22.

Sedgewick, J. (2003). Photoshop Tutorials: Selecting ROIs from Brightfield Images. Microscopy Today. Vol. 11 Number 2: 16 - 20.

Sedgewick, J. (2012) Scientific Imaging: to Sharpen or Obscure? American Laboratory, October 2012, Vol 44, Number 9.

Foster, B. and **Sedgewick, J**. (2014) Is what you see what you saw? Microscopy Today, Vol 22(1): 13 - 15.

Professional Certification

Computer-Assisted Image Analysis, North Carolina State University, 1996. John Russ, Ph.D., instructor.

Applications of Unbiased Stereology to Neural Systems Course, 1997. Peter R. Mouton,

Ph.D. and Mark West, Ph.D., instructors.

Teaching

University of Minnesota (1999 - 2009)

Graduate Courses:

Light and Electron Microscopy. Co-taught with Stan Erlandsen, Ph.D.

Undergraduate Courses:

Tissue Engineering and Microscopy. Co-taught with Allison Hubbel, Ph.D.

Training Workshops Given

Digital Imaging and Quantitation Course, MD Anderson, Houston, TX (2013, 2014).

1st – 3rd Annual Images in Research Course, University of Minnesota, MN (2010-2103).

Immunohistochemistry and Microscopy Course. Society for Histochemistry and Cytochemistry, Woods Hole, MA (2010-2013, 2015).

Digital Imaging and Quantitation Course, University of Vermont, Burlington, VA; University of West Virginia, Morgantown, WV (2013).

Image integrity in scientific research. Keynote Speaker, University of Puerto Rico – San Piedras. (2010).

Digital Imaging Workshops. University of Wisconsin (Madison), University of Michigan, University of Indiana/Purdue, University of Iowa (2005)

Digital Imaging Workshop. University of Arizona, Tucson, AZ (2003)

Photoshop for Research. McCrone Research Institute, Chicago, IL (2002)

Streamlining Digital Imaging Applications. Microscopy Society of America, Long Beach, CA (2001)

Funded Projects

Sedgewick, J. (2000). Inverted Light Microscopy system for Live Cell Analysis. Minnesota Medical Foundation (\$24,000).

Sedgewick, J. (2002). Ultra-Low Light Video Rate Imaging Camera. Minnesota Medical Foundation (\$25,000).

Sedgewick J. (2003). Inverted Microscope for improved imaging of live tissue on a multi-photon confocal system. Grant-in-Aid of Research, Artistry and Scholarship Program (\$25,000).

Instrumentation

Completion of a video-rate, multiphoton microscope according to Sanderson-Parker design: Included power supply and electronic control box for Photomultiplier Tubes (PMTs); video signal matching to board from line scans; housings and connectors for devices; optics; optical bench set up; optimization of pulsed, femtosecond Ti:Sapphire laser; development of isolation and live cell chambers, heating controls, etc. Microscope outperformed those on market (sold for over 1 million) at the time of completion (2006 – 2008).

Completion of a Second Harmonic Generation (SHG) multiphoton confocal microscope using an Olympus Fluoview 300 unit with 3 external detectors, electronics control box, optics, optical bench set up, etc. (2007).

Construction of custom made metal-halide lamps for microscope illumination, along with additional, experimental light sources (2008).

Education

Bachelor's Degree, University of Iowa, 1976

Select Volunteer Activities

Prevail News founder, a street newspaper sold by homeless to generate income.

ISAIAH, a faith-based group for social justice: phone calling, speaking with legislators.

Minnesota Microscopy Society: demonstrating microscopy at local museums.

Nonverbal Learning Disorder Parent's Group

Nicaragua Orphanage Repair Trips

Tutoring Program at St. Peter Claver

Kinship Program, Lutheran Brotherhood (similar to Big Brothers)