

Refereed Publications

1) Fowlkes C.C., Eckenrode K.B., Bragdon M.D., Meyer M., Wunderlich Z., Simirenko L., Luengo Hendriks C.L., Keränen S.V.E., Henriquez C., Knowles D.W., Biggin M.D., Eisen M.B., DePace A.H. (2011) **A conserved developmental patterning network produces quantitatively different output in multiple species of *Drosophila***. *PLoS Genetics*. 7(10):e1002346.

2) Aswani A., Keränen S., Brown J., Fowlkes C., Knowles D., Biggin M., Bickel P., Tomlin C. (2010) **Nonparametric Identification of Regulatory Interactions from Spatial and Temporal Gene Expression Data**. *BMC Bioinformatics* 11:413.

3) Rübel O., Weber G.H., Huang M.-Y., Bethel E.W., Biggin M.D., Fowlkes C.C., Luengo Hendriks C.L., Keränen S.V.E., Eisen M.B., Knowles D.W., Malik J., Hagen H., Hamann B. (2010) **Integrating data clustering and visualization for the analysis of 3D gene expression data**. *IEEE/ACM Transactions on Computational Biology and Bioinformatics* 7(1):64-79.

4) MacArthur S., Li X.-Y., Li J., Brown J.B., Chu H.C., Zeng L., Grondona B.P., Hechmer A., Simirenko L., Keränen S.V.E., Knowles D.W., Stapleton Bickel M., P., Biggin M.D., Eisen M.B. (2009) **Developmental roles of 21 *Drosophila* transcription factors are determined by quantitative differences in binding to an overlapping set of thousands of genomic regions**. *Genome Biology* 10(7):R80.

The 17th most accessed article for past year in Genome Biology (2009), included in F1000 Biology list, *Drosophila* Image Award 2010 Finalist, Shortlisted for the Genome Biology Award 2009

5) Weber G.H., Rübel O., Huang M.-Y., DePace A.H., Fowlkes C.C., Keränen S.V.E., Luengo Hendriks C.L., Hagen H., Knowles D.W., Malik J., Biggin M.D., Hamann B. (2009) **Visual exploration of three-dimensional gene expression using physical views and linked abstract views**. *IEEE/AMC Transactions on Computational Biology and Bioinformatics* 6(2):296-309.

6) Fowlkes C.C., Luengo Hendriks C.L., Keränen S.V.E., Weber G.H., Rübel O., M.-Y. Huang, Chatoor S., Simirenko L., Henriquez C., Beaton A., Weiszmann R., Celniker S., Eisen M.B., Biggin M.D. (2008) **Constructing a quantitative spatio-temporal atlas of gene expression in the *Drosophila* blastoderm**. *Cell* 133(2):364-374.

Commented in *Developmental Cell* 2008 May;14(5):639-40. and *Nature Methods* 2008 Jun;5(6):466

7) Luengo Hendriks, C.L., Keränen, S.V.E., Biggin, M.D., Knowles, D.W.K. (2007) **Automatic channel unmixing for high-throughput quantitative analysis of fluorescence images**. *Optics Express* 15(19):12306-12317.

8) Keränen, S.V.E.*, Fowlkes C.C.*, Luengo Hendriks C.L.*, Sudar D., Knowles D.W., Malik J., Biggin M.D. (2006) **Three-dimensional morphology and gene expression in the *Drosophila* blastoderm at cellular resolution II: dynamics**. *Genome Biology* 7(12):R124.

* co-equal first authors

Commented in *Nature Reviews Genetics* 2007 February;8(2):88-89. and *American Scientist* 2007 January-February 95, *Drosophila* Image Award 2007 Finalist

9) Luengo Hendriks C.L.*, Keränen S.V.E.*, Fowlkes C.C., Simirenko L., Weber G.H., DePace A.H., Henriquez C., Kaszuba D.W., Hamann B., Eisen M.B., Malik J., Sudar D., Biggin M.D., Knowles D.W. (2006) **Three-dimensional morphology and gene expression in the *Drosophila* blastoderm at cellular resolution I: data acquisition pipeline**. *Genome Biology* 7(12):R123.

* co-equal first authors

Commented in Nature Reviews Genetics 2007 February;8(2):88-89. and American Scientist 2007 January-February 95

10) Keränen S.V.E. (2004) **Simulation study on effects of signaling network structure on the developmental increase in complexity.** *Journal of Theoretical Biology* 231(1):3-21, Erratum in *Journal of Theoretical Biology* 242(1):263.

11) Keränen S.V.E. (2001) **Molekyylit, kehitysbiologia ja muodon evoluutio.** *Luonnon Tutkija* 105:10-21. (review in Finnish)

An honorary mention and a recognition prize in a 1999 scientific writing competition by Luonnon Tutkija

12) Jernvall J., Keränen S.V.E., Thesleff I. (2000) **Evolutionary modification of development in mammalian teeth: Quantifying gene expression patterns and topography.** *Proceedings of the National Academy of Sciences of the United States of America* 97(26): 14444-14448.

Commented in Proceedings of the National Academy of Sciences of the United States of America 97(26):14019-1421.

13) Keränen S.V.E., Kettunen P., Åberg T., Thesleff I., Jernvall J. (1999) **Gene expression patterns associated with suppression of odontogenesis in mouse and vole diastema regions.** *Development Genes & Evolution* 209(8):495-506.

14) Keränen S.V.E., Åberg T., Kettunen P., Thesleff I., Jernvall J. (1998). **Association of developmental regulatory genes with the development of different molar tooth shapes in two species of rodents.** *Development Genes & Evolution* 208(9):477-86.

A journal cover figure in the same issue

15) Jernvall J., Åberg T., Kettunen P., Keränen S., Thesleff I. (1998) **The life history of an embryonic signaling center: BMP-4 induces p21 and is associated with apoptosis in the mouse tooth enamel knot.** *Development* 125(2):161-9.

16) Vaahtokari A., Åberg T., Jernvall J., Keränen S., Thesleff I. (1996) **The enamel knot as a signaling center in the developing mouse tooth.** *Mechanisms of Development* 54(1):39-43.

Articles, in non-refereed journals

1) Thesleff I., Keränen S., Jernvall J. (2001) **Enamel knots as signaling centers linking tooth morphogenesis and odontoblast differentiation.** *Advances in Dental Research* 15(1):14-18.

2) Keränen S.V.E. (1998) **Kehitysbiologian ja evoluution uusi synteesi.** *Solubiologi* 1:23-29. (review in Finnish)

Conference publications, technical reports, etc.

1) Barron J.T., Arbeláez P., Keränen S.V.E., Biggin M.D., Knowles D.W., Malik J., (2013) **Volumetric Semantic Segmentation using Pyramid Context Features.** In: *International Conference on Computer Vision (ICCV), Sydney Australia, 2013, pp. 3448 - 3455.*

2) Rübél, O., Keränen S.V.E., Biggin M.D., Knowles D.W., Weber G.H., Hagen H., Hamann B. Bethel E.W. (2012) **Linking Advanced Visualization and MATLAB for the Analysis of 3D Gene Expression Data.** In: Hege, H.-C., Linsen L., eds., *Mathematics and Visualization,*

Visualization in Medicine and Life Sciences II, Progress and New Challenges, Springer Verlag, Heidelberg, Germany, 2012, pp 267-285.

3) Huang M.-Y., Mackey L., Keränen S.V.E., Weber G.H., Jordan M.I., Knowles D.W., Biggin M.D., Hamann B. (2011) **Visually Relating Gene Expression and in vivo DNA Binding Data.** in: *Wu F.-X., Zaki M., Morishita S., Pan Y., Wong S., Christianson A., and Hu, X., eds., Proceedings of 2011 IEEE International Conference on Bioinformatics and Biomedicine, pp. 586-589, Atlanta, Georgia, USA, November 12-15, 2011.*

4) Rübel, O., Ahern S., Bethel E.W., Biggin M.D., Childs H., Cornier-Michel E., DePace A.H., Eisen M.B., Fowlkes C.C., Geddes, C.G.R., Hagen H., Hamann B., Huang M.-Y., Keränen S.V.E., Knowles D.W., Luengo Hendriks C.L., Malik J., Meredith J., Messmer P., Prabhat, Ushizima D., Weber G.H., Wu K. (2010) **Coupling visualization and data analysis for knowledge discovery from multi-dimensional scientific data.** *Procedia Computer Science, Volume 1, Issue 1, Proceedings of International Conference on Computational Science, ICCS 2010, May 2010, Pages 1751-1758.*

5) Rübel, O., Weber G.H., Huang M.-Y., Bethel E.W., Keränen S.V.E., Fowlkes C.C., Luengo Hendriks C.L., DePace A.H., Simirenko L., Eisen M.B., Biggin M.D., Hagen H., Malik J., Knowles D.W., Hamann B. (2008) **PointCloudXplore 2: Visual Exploration of 3D Gene Expression.** in: *Hagen, H., Hering-Bertram, M., and Garth, C., eds, Visualization of Large and Unstructured Data Sets, GI Lecture Notes in Informatics, Vol. S-7, Gesellschaft für Informatik (GI), Bonn, Germany, pp 125-137.*

6) Rübel O., Weber G.H., Keränen S.V.E., Fowlkes C.C., Luengo Hendriks C.L., Simirenko L., Shah N.Y., Eisen M.B., Biggin M.D., Hagen H., Sudar D., Malik J., Knowles D.W., Hamann B. (2006) **PointCloudXplore: Visual analysis of 3D gene expression data using physical views and parallel coordinates.** in: *B. Sousa Santos, T. Ertl and K. Joy (eds.), Data Visualization 2006 (Proceedings of the Eurographics/IEEE-VGTC Symposium on Visualization, Lisbon, Portugal, May), pp. 203-210.*

7) Rübel O., Weber G.H., Keränen S.V.E., Fowlkes C.C., Luengo Hendriks C.L., Simirenko L., Shah N.Y., Eisen M.B., Biggin M.D., Hagen H., Sudar D., Malik J., Knowles D.W., Hamann B. (2006) **PointCloudXplore: A Visualization Tool for 3D Gene Expression Data.** in: *H. Hagen, A. Kerren and P. Dannemann (eds.), Visualization of Large and Unstructured Data Sets, Lecture Notes in Informatics, Vol. S-4, Gesellschaft für Informatik, Bonn, Germany, pp. 107-117.*

8) Fowlkes C.C., Luengo Hendriks C.L., Keränen S.V.E., Biggin M.D., Knowles D.W., Sudar D., Malik J. (2005) **Registering Drosophila Embryos at Cellular Resolution to Build a Quantitative 3D Map of Gene Expression Patterns and Morphology.** *2005 IEEE Computational Systems Bioinformatics Conference, Workshop on BioImage Data Mining and Informatics, pp. 354-357.*

9) Weber G.H., Luengo Hendriks C.L., Keränen S.V.E., Dillard S.E., Ju D.Y., Sudar D., Hamann B.E. (2005) **Visualization for Validation and Improvement of Three-dimensional Segmentation Algorithms.** in *K. Brodli, D.J. Duke and K.I. Joy (eds.) Eurographics – IEEE VGTC Symposium in Visualization (2005), pp. 93-100.*

10) Knowles D.W., Keränen, S., Biggin, M.D., Sudar, D. (2002) **Mapping organism expression levels at cellular resolution in developing Drosophila.** *Proceedings of the SPIE - The International Society for Optical Engineering 4621: 57-64.*