

Research

- 550 **Specificity of Phosphorylation Responses to Mitogen Activated Protein (MAP) Kinase Pathway Inhibitors in Melanoma Cells**
[S] *Joel Basken, Scott A. Stuart, Andrew J. Kavran, Thomas Lee, Christopher C. Ebmeier, William M. Old, and Natalie G. Ahn*
- 565 **Combinatorial Omics Analysis Reveals Perturbed Lysosomal Homeostasis in Collagen VII-deficient Keratinocytes**
[S] *Kerstin Thriene, Björn Andreas Grüning, Olivier Bornert, Anika Erxleben, Juna Leppert, Ioannis Athanasiou, Ekkehard Weber, Dimitra Kiritsi, Alexander Nyström, Thomas Reinheckel, Rolf Backofen, Cristina Has, Leena Bruckner-Tuderman, and Jörn Dengjel*
- 580 **Cross-species Comparison of Proteome Turnover Kinetics**
[S] ✎ *Kyle Swovick, Kevin A. Welle, Jennifer R. Hryhorenko, Andrei Seluanov, Vera Gorbunova, and Sina Ghaemmaghami*
- 592 **Quantitative Proteomics After Spinal Cord Injury (SCI) in a Regenerative and a Nonregenerative Stage in the Frog *Xenopus laevis***
[S] ✎ *Dasfne Lee-Liu, Liangliang Sun, Norman J. Dovichi, and Juan Larraín*
- 607 **Multimiomics Integration Reveals the Landscape of Prometastasis Metabolism in Hepatocellular Carcinoma**
[S] *Yongmei Li, Hao Zhuang, Xinran Zhang, Yuan Li, Yun Liu, Xianfu Yi, Guoxuan Qin, Wen Wei, and Ruibing Chen*
- 619 **A Model of Dormant-Emergent Metastatic Breast Cancer Progression Enabling Exploration of Biomarker Signatures**
[S] *Amanda M. Clark, Manu P. Kumar, Sarah E. Wheeler, Carissa L. Young, Raman Venkataramanan, Donna B. Stolz, Linda G. Griffith, Douglas A. Lauffenburger, and Alan Wells*
- 631 **N-glycome of the Lysosomal Glycocalyx is Altered in Niemann-Pick Type C Disease (NPC) Model Cells**
[S] *Marko Kosicek, Ivan Gudelj, Anita Horvatic, Tanja Jovic, Frano Vuckovic, Gordan Lauc, and Silva Hecimovic*
- 643 **Quantitative Proteomics of Strong and Weak Biofilm Formers of *Enterococcus faecalis* Reveals Novel Regulators of Biofilm Formation**
[S] *Tanujaa Suriyanarayanan, Lin Qingsong, Lim Teck Kwang, Lee Yew Mun, Thuyen Truong, and Chaminda Jayampath Seneviratne*
- 655 **Temporal Effects of Combined Birinapant and Paclitaxel on Pancreatic Cancer Cells Investigated via Large-Scale, Ion-Current-Based Quantitative Proteomics (IonStar)**
[S] *Xue Wang, Jin Niu, Jun Li, Xiaomeng Shen, Shichen Shen, Robert M. Straubinger, and Jun Qu*

On the Cover: Genomics, transcriptomics, proteomics, and metabolomics were integrated to analyze three hepatocellular carcinoma (HCC) cell lines with differential metastatic potentials. Our study identified 12 genes with variations at multiple levels from three metabolic pathways, including glycolysis, starch and sucrose metabolism, and glutathione metabolism. Furthermore, UDP-glucose pyrophosphorylase 2 (UGP2), was observed to be associated with HCC invasion and metastasis. Taken together, the compendium of multi-omic data provides valuable insights to understand the roles of shifted cellular metabolism in HCC metastasis. For details see the article by Yongmei Li, *et al*, pages 607–618.

- 672 **Integrated Analysis of Proteomic and Transcriptomic Data Highlights Late Fetal Muscle Maturation Process**
Valentin Voillet, Magali San Cristobal, Marie-Christine Pèrè, Yvon Billon, Laurianne Canario, Laurence Liaubet, and Louis Lefaucheur
- 694 **Omics Assisted N-terminal Proteoform and Protein Expression Profiling On Methionine Aminopeptidase 1 (MetAP1) Deletion**
 [S] *Veronique Jonckheere, Daria Fijałkowska, and Petra Van Damme*
- 709 **Proteotranscriptomic Analysis and Discovery of the Profile and Diversity of Toxin-like Proteins in Centipede**
 [S] *Feng Zhao, Xinqiang Lan, Tao Li, Yang Xiang, Fang Zhao, Yun Zhang, and Wen-Hui Lee*
- 721 **Flagellin Glycoproteomics of the Periodontitis Associated Pathogen *Selenomonas sputigena* Reveals Previously Not Described O-glycans and Rhamnose Fragment Rearrangement Occurring on the Glycopeptides**
 [S] *Cornelia B. Rath, Falko Schirmeister, Rudolf Figl, Peter H. Seeberger, Christina Schäffer, and Daniel Kolarich*
- 737 **The Sequence-specific Peptide-binding Activity of the Protein Sulfide Isomerase AGR2 Directs Its Stable Binding to the Oncogenic Receptor EpCAM**
 [S] *M. Aiman Mohtar, Lenka Hernychova, J. Robert O'Neill, Melanie L. Lawrence, Euan Murray, Borek Vojtesek, and Ted R. Hupp*
- 764 **Mapping and Quantification of Over 2000 O-linked Glycopeptides in Activated Human T Cells with Isotope-Targeted Glycoproteomics (Isotag)**
 [S] *Christina M. Woo, Peder J. Lund, Andrew C. Huang, Mark M. Davis, Carolyn R. Bertozzi, and Sharon J. Pitteri*
- 776 **Proteomics Profiling of CLL Versus Healthy B-cells Identifies Putative Therapeutic Targets and a Subtype-independent Signature of Spliceosome Dysregulation**
 [S] *Harvey E. Johnston, Matthew J. Carter, Marta Larrayoz, James Clarke, Spiro D. Garbis, David Oscier, Jonathan C. Strefford, Andrew J. Steele, Renata Walewska, and Mark S. Cragg*
- 792 **Infection by the Helminth Parasite *Fasciola hepatica* Requires Rapid Regulation of Metabolic, Virulence, and Invasive Factors to Adjust to Its Mammalian Host**
 [S] *Krystyna Cwiklinski, Heather Jewhurst, Paul McVeigh, Tara Barbour, Aaron G. Maule, Jose Tort, Sandra M. O'Neill, Mark W. Robinson, Sheila Donnelly, and John P. Dalton*
- 810 **Spatial Tissue Proteomics Quantifies Inter- and Intratumor Heterogeneity in Hepatocellular Carcinoma (HCC)**
 [S] *Katarzyna Buczak, Alessandro Ori, Joanna M. Kirkpatrick, Kerstin Holzer, Daniel Dauch, Stephanie Roessler, Volker Endris, Felix Lasitschka, Luca Parca, Alexander Schmidt, Lars Zender, Peter Schirmacher, Jeroen Krijgsveld, Stephan Singer, and Martin Beck*

Technological Innovation and Resources

- 826 **Simple, scalable, and ultrasensitive tip-based identification of protease substrates**
 [S] *Gerta Shema, Minh T. N. Nguyen, Fiorella A. Solari, Stefan Loroch, A. Saskia Venne, Laxmikanth Kollipara, Albert Sickmann, Steven H. L. Verhelst, and René P. Zahedi*

AUTHOR INDEX

- Ahn, Natalie G., 550
Andreas Grüning, Björn, 565
Athanasίου, Ioannis, 565
- Backofen, Rolf, 565
Barbour, Tara, 792
Basken, Joel, 550
Beck, Martin, 810
Bertozzi, Carolyn R., 764
Billon, Yvon, 672
Bornert, Olivier, 565
Bruckner-Tuderman, Leena, 565
Buczak, Katarzyna, 810
- Canario, Laurianne, 672
Carter, Matthew J., 776
Chen, Ruibing, 607
Clark, Amanda M., 619
Clarke, James, 776
Cragg, Mark S., 776
Cwiklinski, Krystyna, 792
- Dalton, John P., 792
Dauch, Daniel, 810
Davis, Mark M., 764
Dengjel, Jörn, 565
Donnelly, Sheila, 792
Dovich, Norman J., 592
- Ebmeier, Christopher C., 550
Endris, Volker, 810
Erxleben, Anika, 565
- Figl, Rudolf, 721
Fijałkowska, Daria, 694
- Garbis, Spiro D., 776
Ghaemmaghami, Sina, 580
Gorbunova, Vera, 580
Griffith, Linda G., 619
Gudelj, Ivan, 631
- Has, Cristina, 565
Hecimovic, Silva, 631
Hernychova, Lenka, 737
Holzer, Kerstin, 810
Horvatic, Anita, 631
Hryhorenko, Jennifer R., 580
Huang, Andrew C., 764
Hupp, Ted R., 737
- Jewhurst, Heather, 792
Johnston, Harvey E., 776
Jonckheere, Veronique, 694
Jovic, Tanja, 631
- Kavran, Andrew J., 550
Kiritsi, Dimitra, 565
Kirkpatrick, Joanna M., 810
Kolarich, Daniel, 721
Kollipara, Laxmikanth, 826
Kosicek, Marko, 631
Krijgsveld, Jeroen, 810
Kumar, Manu P., 619
Kwang, Lim Teck, 643
- Larraín, Juan, 592
Larrayoz, Marta, 776
Lasitschka, Felix, 810
Lauc, Gordan, 631
Lauffenburger, Douglas A., 619
Lawrence, Melanie L., 737
Lee, Thomas, 550
Lee-Liu, Dasfne, 592
Lefaucheur, Louis, 672
Leppert, Juna, 565
Liaubet, Laurence, 672
Li, Jun, 655
Li, Yongmei, 607
Li, Yuan, 607
Liu, Yun, 607
Loroch, Stefan, 826
Lund, Peder J., 764
- Maule, Aaron G., 792
McVeigh, Paul, 792
Mohtar, M. Aiman, 737
Mun, Lee Yew, 643
Murray, Euan, 737
- Nguyen, Minh T. N., 826
Niu, Jin, 655
Nyström, Alexander, 565
- Old, William M., 550
O'Neill, J. Robert, 737
O'Neill, Sandra M., 792
Ori, Alessandro, 810
Oscier, David, 776
- Père, Marie-Christine, 672
Parca, Luca, 810
Pitteri, Sharon J., 764
- Qin, Guoxuan, 607
Qingsong, Lin, 643
Qu, Jun, 655
- Rath, Cornelia B., 721
Reinheckel, Thomas, 565
Robinson, Mark W., 792
Roessler, Stephanie, 810

San Cristobal, Magali, 672
Schäffer, Christina, 721
Schirmacher, Peter, 810
Schirmeister, Falko, 721
Schmidt, Alexander, 810
Seeberger, Peter H., 721
Seluanov, Andrei, 580
Seneviratne, Chaminda Jayampath, 643
Shema, Gerta, 826
Shen, Shichen, 655
Shen, Xiaomeng, 655
Sickmann, Albert, 826
Singer, Stephan, 810
Solari, Fiorella A., 826
Steele, Andrew J., 776
Stolz, Donna B., 619
Straubinger, Robert M., 655
Strefford, Jonathan C., 776
Stuart, Scott A., 550
Sun, Liangliang, 592
Suriyanarayanan, Tanujaa, 643
Swovick, Kyle, 580

Thriene, Kerstin, 565
Tort, Jose, 792

Truong, Thuyen, 643

Van Damme, Petra, 694
Venkataramanan, Raman, 619
Venne, A. Saskia, 826
Verhelst, Steven H. L., 826
Voillet, Valentin, 672
Vojtesek, Borek, 737
Vuckovic, Frano, 631

Walewska, Renata, 776
Wang, Xue, 655
Weber, Ekkehard, 565
Wei, Wen, 607
Welle, Kevin A., 580
Wells, Alan, 619
Wheeler, Sarah E., 619
Woo, Christina M., 764

Yi, Xianfu, 607
Young, Carissa L., 619

Zahedi, René P., 826
Zender, Lars, 810
Zhang, Xinran, 607
Zhuang, Hao, 607