

dr. Romana Schirhagl
Assistent Professor
Department of Biomedical Engineering: General
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Research interests

Diamond, Bioanalysis, Magnetometry, Metabolism, Cells, Molecular Imprinting, Imaging

Working experience

from 2014 University of Groningen University Medical Center Groningen Department of Biomedical Engineering as Tenure Track Assistant Professor leading the Bioimaging and Bioanalysis group
2011-2013 Postdoc at ETH-Zurich, Physics Department, Degen group
2010-2011 Postdoc at Stanford University, Chemistry Department, Zare group
2009-2010 Postdoc at Vienna University, Analytical Chemistry Department, Dickert group
2007-2009 PhD student at Vienna University, Analytical Chemistry Department, Dickert group

Education

2007-2009 Bachelor study in Biology at Vienna University (2nd degree not finished)
2003-2007 Diploma study in Chemistry (equivalent to a Bachelor+Masters finished one year below official minimal time) at Vienna University,
1995-2003 Grammar school (Bundesrealgymnasium Steyr)

Activities

IST Austria institute Colloquium

Romana Schirhagl (Attendee)
28-Mar-2022

MRS fall meeting

Romana Schirhagl (Attendee)
29-Nov-2021 → 2-Dec-2021

Colloquium at Technische Universität Kaiserslautern

Romana Schirhagl (Attendee)
28-Sep-2021

QUANTUM Seminar Wintersemester 2021/22

Romana Schirhagl (Attendee)
21-Jul-2021

Optics and Lasers

Romana Schirhagl (Attendee)
28-Jun-2021

2nd International conference on Pharma Industry & pharmaceuticals

Romana Schirhagl (Keynote speaker)
27-Mar-2021

COMSATS University (External organisation)

Romana Schirhagl (Reviewer)
2021

German Research Foundation (External organisation)

Romana Schirhagl (Member of board)
2021

Hasselt University (External organisation)

Romana Schirhagl (Advisor)
2021

NWO (External organisation)

Romana Schirhagl (Member of board)
2021

NWO (External organisation)

Romana Schirhagl (Reviewer)
2021

Silesian Tech Univ, Silesian University of Technology, Fac Biomed Engn, Dept Biomat & Med Devices Engn (External organisation)

Romana Schirhagl (Advisor)
2021

Sir Henry (Publisher)

Romana Schirhagl (Peer reviewer)
2021

Biointerfaces 2020 conference

Romana Schirhagl (Attendee)
25-Aug-2020 → 27-Aug-2020

External Reviewer

Romana Schirhagl (Consultant)
2020 → ...

External reviewer for PhD thesis

Romana Schirhagl (Member of Assessment Committee)
2020 → ...

External reviewer for PhD thesis

Romana Schirhagl (Examiner)
2020 → ...

Israeli Ministry of Science and Technology for the call "Indian-Israeli joint research cooperation" (External organisation)

Romana Schirhagl (Reviewer)
2020

Periyar University India (External organisation)

Romana Schirhagl (Reviewer)
2020

Sonderforschungsbereich (SFB) (External organisation)

Romana Schirhagl (Member)
2020 → 2021

Sonderforschungsbereich (SFB) (External organisation)

Romana Schirhagl (Member)
2020 → 2021

The University of Melbourne (External organisation)

Romana Schirhagl (Reviewer)
2020

Diamond magnetometry in a cell

Romana Schirhagl (Speaker)
16-Sep-2019 → 19-Sep-2019

PhD Day 2019

Romana Schirhagl (Invited speaker)
20-Jul-2019

Diamond and Single Photon Emitters

Romana Schirhagl (Speaker)
23-Jun-2019 → 28-Jun-2019

Imaging with Nanodiamond Probes

Romana Schirhagl (Keynote speaker)
19-Jun-2019 → 21-Jun-2019

UMCG bouwt brug

Romana Schirhagl (Speaker)
19-May-2019

WE-Heraeus Seminar

Romana Schirhagl (Speaker)
25-Mar-2019 → 28-Mar-2019

External adviser for PhD thesis

Romana Schirhagl (Consultant)
1-Jan-2019 → 31-Dec-2019

External adviser for tenure track evaluations

Romana Schirhagl (Consultant)
1-Jan-2019 → 31-Dec-2019

Frontiers in Physics (Journal)

Romana Schirhagl (Editorial board member)
1-Jan-2019 → 31-Dec-2019

Nanomaterials (Basel, Switzerland) (Journal)

Romana Schirhagl (Editorial board member)
1-Jan-2019 → 31-Dec-2019

NWO grants ENW KLEIN (External organisation)

Romana Schirhagl (Member)
1-Jan-2019 → 31-Dec-2019

Proposal reviewer

Romana Schirhagl (Consultant)
1-Jan-2019 → 31-Dec-2019

Proposal reviewer

Romana Schirhagl (Consultant)
1-Jan-2019 → 31-Dec-2019

Proposal reviewer

Romana Schirhagl (Consultant)
1-Jan-2019 → 31-Dec-2019

Proposal reviewing for GSMs PhD call

Romana Schirhagl (Consultant)
1-Jan-2019 → 31-Dec-2019

Reviewer

Romana Schirhagl (Consultant)
1-Jan-2019 → 31-Dec-2019

ZonMW grants for the call Enabling Technologies Hotels (External organisation)

Romana Schirhagl (Member)
1-Jan-2019 → 31-Dec-2019

Rosalind Franklin Univ Med & Sci (External organisation)

Romana Schirhagl (Member)
2019 → ...

W.J. Kolff Institute for Biomedical Engineering and Materials Science (KOLFF) (Organisational unit)

Romana Schirhagl (Member)
2019 → ...

Micro ESR: On chip magnetic resonance spectroscopy of microliter samples

Romana Schirhagl (Keynote speaker)
14-Aug-2018

DFG proposal reviewer

Romana Schirhagl (Consultant)
1-Jan-2018 → 31-Dec-2018

Dutch FOM (Dutch Physics Association) Projectruimte Grants (External organisation)

Romana Schirhagl (Member)
1-Jan-2018 → 31-Dec-2018

Award committee International Conference on Diamond and Carbon Materials Series (External organisation)

Romana Schirhagl (Member)
2018

Charles University

Romana Schirhagl (Visiting researcher)
2018

Department of Chemistry, Stanford University, Stanford, California, USA

Romana Schirhagl (Visiting researcher)
2018

Department of Physics, University of California, Santa Barbara, USA
Romana Schirhagl (Visiting researcher)
2018

Empa, Swiss Federal Laboratories for Materials Science & Technology (EMPA), Swiss Fed Labs Mat Sci & Technol, Lab Protect & Physiol
Romana Schirhagl (Visiting researcher)
2018

External adviser for PhD thesis Charles University in Prague
Romana Schirhagl (Advisor)
2018

Max Planck Society, Frankfurt, Germany
Romana Schirhagl (Visiting researcher)
2018 → ...

Proposal reviewer for German grant institution DFG
Romana Schirhagl (Advisor)
2018

Technical University of Munich (TUM)
Romana Schirhagl (Visiting researcher)
2018

External reviewer
Romana Schirhagl (Consultant)
1-Jan-2017 → 31-Dec-2017

External reviewer for the Czech Science Foundation (GACR).
Romana Schirhagl (Advisor)
2017 → 2018

Hasselt Diamond Workshop (External organisation)
Romana Schirhagl (Member)
2017 → ...

Hasselt Diamond Workshop (External organisation)
Romana Schirhagl (Member)
2017 → ...

External adviser
Romana Schirhagl (Consultant)
1-Jan-2016 → 31-Dec-2016

Chemical Society Reviews (Journal)
Romana Schirhagl (Editorial board member)
1-Jan-2015 → 31-Dec-2015

European Physical Society (EPS) (External organisation)
Romana Schirhagl (Member)
2015 → ...

Progress Physics Projectruimte (formerly FOM Projectruimte), NWO (External organisation)

Romana Schirhagl (Member)

2015 → 2018

American Chemical Society (External organisation)

Romana Schirhagl (Member)

2014 → ...

Deutsche Bunsen-Gesellschaft für physikalische Chemie e. V. (DBG) (External organisation)

Romana Schirhagl (Member)

2014 → ...

External adviser

Romana Schirhagl (Examiner)

2014 → ...

Frontiers in Materials : Translational Materials Science (Journal)

Romana Schirhagl (Editorial board member)

2014 → ...

W.J. Kolff Institute for Biomedical Engineering and Materials Science (KOLFF) (Organisational unit)

Romana Schirhagl (Member)

2014 → ...

The German Chemical Society (GDCh) (External organisation)

Romana Schirhagl (Member)

2013 → ...

QSIT - Quantum Science and Technology (External organisation)

Romana Schirhagl (Member)

2012 → 2014

The Royal Society of Chemistry (RSC) (External organisation)

Romana Schirhagl (Member)

2012 → ...

The Society for Molecular Imprinting (SMI) (External organisation)

Romana Schirhagl (Member)

2012 → ...

Austrian Scientists in Northern America (ASCINA) (External organisation)

Romana Schirhagl (Member)

2010 → ...

Austrian Chemical Society, Medicinal Chemistry (External organisation)

Romana Schirhagl (Member)

2007 → ...

Research output

Detecting the metabolism of individual yeast mutant strain cells when aged, stressed or treated with antioxidants with diamond magnetometry

Morita, A., Nusantara, A. C., Myzk, A., Perona Martinez, F. P., Hamoh, T., Damle, V. G., Laan, K. J. V. D., Sigaeva, A., Vedelaar, T., Chang, M., Chipaux, M. & Schirhagl, R., Feb-2023, In: Nano Today. 48, 13 p., 101704.

Relaxometry with Nitrogen Vacancy (NV) Centers in Diamond

Mzyk, A., Sigaeva, A. & Schirhagl, R., 20-Dec-2022, In: *Accounts of Chemical Research*. 55, 24, p. 3572-3580 9 p.

Intracellular Quantum Sensing of Free-Radical Generation Induced by Acetaminophen (APAP) in the Cytosol, in Mitochondria and the Nucleus of Macrophages

Sharmin, R., Nusantara, A. C., Nie, L., Wu, K., Elias Llumbet, A., Woudstra, W., Mzyk, A. & Schirhagl, R., 10-Nov-2022, In: *ACS Sensors*. 7, 11, p. 3326-3334 9 p.

Diamond-Based Nanoscale Quantum Relaxometry for Sensing Free Radical Production in Cells

Sigaeva, A., Shirzad, H., Perona Martinez, F., Nusantara, A. C., Mougios, N., Chipaux, M. & Schirhagl, R., 3-Nov-2022, In: *Small*. 18, 44, 13 p., 2105750.

Relaxometry for detecting free radical generation during Bacteria's response to antibiotics

Norouzi, N., Nusantara, A. C., Ong, Y., Hamoh, T., Nie, L., Morita, A., Zhang, Y., Mzyk, A. & Schirhagl, R., 31-Oct-2022, In: *Carbon*. 199, p. 444-452 9 p.

Intracellular Relaxometry, Challenges, and Future Directions

Sigaeva, A., Norouzi, N. & Schirhagl, R., 19-Oct-2022, (E-pub ahead of print) In: *ACS central science*.

Detecting free radicals post viral infections

Damle, V. G., Wu, K., Arouri, D. J. & Schirhagl, R., Oct-2022, In: *Free Radical Biology and Medicine*. 191, p. 8-23 16 p.

Functionalized Fluorescent Nanodiamonds for Simultaneous Drug Delivery and Quantum Sensing in HeLa Cells

Tian, Y., Nusantara, A. C., Hamoh, T., Mzyk, A., Tian, X., Martinez, F. P., Li, R., Permentier, H. P. & Schirhagl, R., 31-Aug-2022, In: *ACS Applied Materials & Interfaces*. 14, 34, p. 39265-39273 9 p.

Single-Particle Tracking and Trajectory Analysis of Fluorescent Nanodiamonds in Cell-Free Environment and Live Cells

Sigaeva, A., Hochstetter, A., Bouyim, S., Chipaux, M., Stejfova, M., Cigler, P. & Schirhagl, R., 29-Aug-2022, (E-pub ahead of print) In: *Small*. 17 p., 2201395.

Insight into a Fenton-like Reaction Using Nanodiamond Based Relaxometry

Padamati, S. K., Vedelaar, T. A., Martinez, F. P., Nusantara, A. C. & Schirhagl, R., Jul-2022, In: *Nanomaterials*. 12, 14, 12 p., 2422.

Nanoscale MRI for Selective Labeling and Localized Free Radical Measurements in the Acrosomes of Single Sperm Cells

Reyes-San-Martin, C., Hamoh, T., Zhang, Y., Berendse, L., Klijn, C., Li, R., Llumbet, A. E., Sigaeva, A., Kawalko, J., Mzyk, A. & Schirhagl, R., 30-Jun-2022, In: *Acs Nano*. 16, 7, p. 10701-10710 10 p.

Applying NV center-based quantum sensing to study intracellular free radical response upon viral infections

Wu, K., Vedelaar, T. A., Damle, V. G., Morita, A., Mougnaud, J., Reyes San Martin, C., Zhang, Y., van der Pol, D. P. I., Ende-Metselaar, H., Rodenhuis-Zybert, I. & Schirhagl, R., 1-Jun-2022, In: *Redox Biology*. 52, 11 p., 102279.

Quantum Sensing of Free Radicals in Primary Human Dendritic Cells

Nie, L., Nusantara, A. C., Damle, V. G., Baranov, M. V., Chipaux, M., Reyes-San-Martin, C., Hamoh, T., Epperla, C. P., Guricova, M., Cigler, P., Van Den Bogaart, G. & Schirhagl, R., 23-Feb-2022, In: *Nano Letters*. 22, 4, p. 1818-1825 8 p.

Following Polymer Degradation with Nanodiamond Magnetometry

Li, R., Vedelaar, T., Mzyk, A., Morita, A., Padamati, S. K. & Schirhagl, R., 28-Jan-2022, In: *ACS Sensors*. 1, p. 123-130

Diamond Color Centers in Diamonds for Chemical and Biochemical Analysis and Visualization

Mzyk, A., Ong, Y., Ortiz Moreno, A. R., Padamati, S. K., Zhang, Y., Reyes-San-Martin, C. A. & Schirhagl, R., 11-Jan-2022, In: *Analytical Chemistry*. 94, 1, p. 225-249 25 p.

Nanotechnology from lab to industry - a look at current trends

Rambaran, T. & Schirhagl, R., 2022, In: *Nanoscale advances*. 4, p. 3664-3675 12 p.

Fluorescent Nanodiamonds for Detecting Free-Radical Generation in Real Time during Shear Stress in Human Umbilical Vein Endothelial Cells

Sharmin, R., Hamoh, T., Sigaeva, A., Mzyk, A., Damle, V. G., Morita, A., Vedelaar, T. & Schirhagl, R., 24-Dec-2021, In: *ACS Sensors*. 6, 12, p. 4349-4359 11 p.

Drug delivery and antimicrobial studies of chitosan-alginate based hydroxyapatite bioscaffolds formed by the Casein micelle assisted synthesis

Jariya, S. A. I., Padmanabhan, V. P., Kulandaivelu, R., Prakash, N., Mohammad, F., Al-Lohedan, H. A., Paiman, S., Schirhagl, R., Hossain, M. A. M. & Sagadevan, S., 1-Nov-2021, In: *Materials Chemistry and Physics*. 272, 11 p., 125019.

Male subfertility and oxidative stress

Evans, E. P. P., Scholten, J. T. M., Mzyk, A., Reyes-San-Martin, C., Llumbet, A. E., Hamoh, T., Arts, E. G. J. M., Schirhagl, R. & Cantineau, A. E. P., Oct-2021, In: *Redox Biology*. 46, 17 p., 102071.

Pharmacodynamic studies of fluorescent diamond carriers of doxorubicin in liver cancer cells and colorectal cancer organoids

Firestein, R., Marcinkiewicz, C., Nie, L., Chua, H. K., Quesada, I. V., Torelli, M., Sternberg, M., Gligorijevic, B., Shenderova, O., Schirhagl, R. & Feuerstein, G. Z., Sep-2021, In: *Nanotechnology, Science and Applications*. 14, p. 139-159 21 p.

Not all cells are created equal - endosomal escape in fluorescent nanodiamonds in different cells

Zhang, Y., Sharmin, R., Sigaeva, A., Klijn, C. W. M., Mzyk, A. & Schirhagl, R., 21-Aug-2021, In: *Nanoscale*. 13, p. 13294-13300 7 p.

pH Sensitive Dextran Coated Fluorescent Nanodiamonds as a Biomarker for HeLa Cells Endocytic Pathway and Increased Cellular Uptake

Nie, L., Zhang, Y., Li, L., van Rijn, P. & Schirhagl, R., 15-Jul-2021, In: *Nanomaterials*. 11, 7, p. 1-11 11 p., 1837.

Novel uric acid-based nano organocatalyst with phosphorous acid tags: Application for synthesis of new biologically-interest pyridines with indole moieties via a cooperative vinylogous anomeric based oxidation

Kalhor, S., Zarei, M., Sepehrmansourie, H., Zolfigol, M. A., Shi, H., Wang, J., Arjomandi, J., Hasani, M. & Schirhagl, R., May-2021, In: *Molecular catalysis*. 507, 16 p., 111549.

Quantum monitoring of cellular metabolic activities in single mitochondria

Nie, L., Nusantara, A. C., Damle, V. G., Sharmin, R., Evans, E. P. P., Hemelaar, S. R., van der Laan, K. J., Li, R., Martinez, F. P. P., Vedelaar, T., Chipaux, M. & Schirhagl, R., May-2021, In: *Science Advances*. 7, 21, 8 p., 0573.

Recent advances in natural polymer-based hydroxyapatite scaffolds: Properties and applications

Lett, J. A., Sagadevan, S., Fatimah, I., Hoque, M. E., Lokanathan, Y., Leonard, E., Alshahateet, S. F., Schirhagl, R. & Oh, W. C., 5-Apr-2021, In: *European Polymer Journal*. 148, 18 p., 110360.

Membrane-Based Scanning Force Microscopy

Hälg, D., Gisler, T., Tsaturyan, Y., Catalini, L., Grob, U., Krass, M. D., Héritier, M., Mattiat, H., Thamm, A. K., Schirhagl, R., Langman, E. C., Schliesser, A., Degen, C. L. & Eichler, A., Feb-2021, In: *Physical Review Applied*. 15, 2, 6 p., L021001.

Synthesis of biological based hennotannic acid-based salts over porous bismuth coordination polymer with phosphorous acid tags

Babaei, S., Zarei, M., Zolfigol, M. A., Khazalpour, S., Hasani, M., Rinner, U., Schirhagl, R., Norouzi, N. & Rostamnia, S., 22-Jan-2021, In: *RSC Advances*. 11, 4, p. 2141-2157 17 p.

Nanodiamond Relaxometry-Based Detection of Free-Radical Species When Produced in Chemical Reactions in Biologically Relevant Conditions

Martinez, F. P., Nusantara, A. C., Chipaux, M., Padamati, S. K. & Schirhagl, R., 24-Dec-2020, In: ACS Sensors. 5, 12, p. 3862-3869 8 p.

Influence of sonication on the physicochemical and biological characteristics of selenium-substituted hydroxyapatites

Padmanabhan, V. P., Kulandaivelu, R., Venkatachalam, V., Veerla, S. C., Mohammad, F., Al-Lohedan, H. A., Oh, W. C., Schirhagl, R., Obulapuram, P. K., Hoque, M. E. & Sagadevan, S., 28-Oct-2020, In: New Journal of Chemistry. 44, 40, p. 17453-17464 12 p.

Targeting Nanodiamonds to the Nucleus in Yeast Cells

Morita, A., Hamoh, T., Sigaeva, A., Norouzi, N., Nagl, A., van der Laan, K. J., Evans, E. P. P. & Schirhagl, R., Oct-2020, In: Nanomaterials. 10, 10, p. 1-10 10 p.

Quantum monitoring the metabolism of individual yeast mutant strain cells when aged, stressed or treated with antioxidant

Morita, A., Nusantara, C., Perona Martinez, F., Hamoh, T., Damle, V., Laan, van der, K., Sigaeva, A., Vedelaar, T., Chang, M., Chipaux, M. & Schirhagl, R., 31-Jul-2020, (Submitted) In: ArXiv. 36 p.

Micro Versus Macro: The Effect of Environmental Confinement on Cellular Nanoparticle Uptake

Damle, V. G., Sharmin, R., Morita, A., Nie, L. & Schirhagl, R., 24-Jul-2020, In: Frontiers in Bioengineering and Biotechnology. 8, 13 p., 869.

Effect of medium and aggregation on antibacterial activity of nanodiamonds

Norouzi, N., Ong, Y., Damle, V. G., Najafi, M. B. H. & Schirhagl, R., Jul-2020, In: Materials science & engineering c-Biomimetic and supramolecular systems. 112, 8 p., 110930.

High Temperature Treatment of Diamond Particles Toward Enhancement of Their Quantum Properties

Torelli, M. D., Nunn, N. A., Jones, Z. R., Vedelaar, T., Padamati, S. K., Schirhagl, R., Hamers, R. J., Shames, A. I., Danilov, E. O., Zaitsev, A. & Shenderova, O. A., 10-Jun-2020, In: Frontiers of Physics. 8, 11 p., 205.

Influence of diamond crystal orientation on the interaction with biological matter

Damle, V., Wu, K., De Luca, O., Orti-Casan, N., Norouzi, N., Morita, A., de Vries, J., Kaper, H., Zuhorn, I. S., Eisel, U., Vanpoucke, D. E. P., Rudolf, P. & Schirhagl, R., Jun-2020, In: Carbon. 162, p. 1-12 12 p.

Polyelectrolyte Multilayer Films Modification with Ag and rGO Influences Platelets Activation and Aggregate Formation under In Vitro Blood Flow

Imbir, G., Mzyk, A., Trembecka-Wójciga, K., Jasek-Gajda, E., Plutecka, H., Schirhagl, R. & Major, R., May-2020, In: Nanomaterials (Basel, Switzerland). 10, 5, 17 p., 859.

The Fate of Lipid-Coated and Uncoated Fluorescent Nanodiamonds during Cell Division in Yeast

Morita, A., Hamoh, T., Martinez, F. P. P., Chipaux, M., Sigaeva, A., Mignon, C., Laan, K. J. V. D., Hochstetter, A. & Schirhagl, R., Mar-2020, In: Nanomaterials (Basel, Switzerland). 10, 3, 17 p., 516.

Evaluation of the Oxidative Stress Response of Aging Yeast Cells in Response to Internalization of Fluorescent Nanodiamond Biosensors

van der Laan, K. J., Morita, A., Perona-Martinez, F. P. & Schirhagl, R., 20-Feb-2020, In: Nanomaterials (Basel, Switzerland). 10, 2, 13 p., 372.

Exploring the thumbprints of Ag-hydroxyapatite composite as a surface coating bone material for the implants

Lett, J. A., Sagadevan, S., Paiman, S., Mohammad, F., Schirhagl, R., Leonard, E., Alshahateet, S. F. & Oh, W.-C., 2020, In: Journal of Materials Research and Technology. 9, 6, p. 12824-12833 10 p.

Non enzymatic fluorometric determination of glucose by using quenchable g-C₃N₄ quantum dots

Gan, X., Zhao, H., Schirhagl, R. & Quan, X., Dec-2019, In: Microchimica Acta. 186, 12, 10 p., 779.

Nanodiamond uptake in colon cancer cells: the influence of direction and trypsin-EDTA treatment

Sigaeva, A., Morita, A., Hemelaar, S. R. & Schirhagl, R., 7-Oct-2019, In: *Nanoscale*. 11, 37, p. 17357-17367 11 p.

Smart probe for simultaneous detection of copper ion, pyrophosphate, and alkaline phosphatase in vitro and in clinical samples

Kiran, S., Khatik, R. & Schirhagl, R., Sep-2019, In: *Analytical and Bioanalytical Chemistry*. 411, 24, p. 6475-6485 11 p.

Nanodiamond for Sample Preparation in Proteomics

Perona Martinez, F., Nagl, A., Guluzade, S. & Schirhagl, R., 6-Aug-2019, In: *Analytical Chemistry*. 91, 15, p. 9800-9805 6 p.

Paving the way for intracellular detection of free radicals with nanodiamond magnetometry

Sigaeva, A., Martinez, F. P., Nusantara, A. C., Mougios, N. & Schirhagl, R., 1-Aug-2019, In: *Free Radical Biology and Medicine*. 139, S1, p. S50 1 p.

Cell Uptake of Lipid-Coated Diamond

Morita, A., Perona Martinez, F., Chipaux, M., Jamot, N., Hemelaar, S., Laan, van der, K. & Schirhagl, R., Aug-2019, In: *Particle and Particle Systems Characterization*. 36, 8, 8 p., 1900116.

Facile in situ generation of bismuth tungstate nanosheet-multiwalled carbon nanotube composite as unconventional affinity material for quartz crystal microbalance detection of antibiotics

Munawar, A., Schirhagl, R., Rehman, A., Shaheen, A., Taj, A., Bano, K., Bassous, N. J., Webster, T. J., Khan, W. S. & Bajwa, S. Z., 5-Jul-2019, In: *Journal of hazardous materials*. 373, p. 50-59 10 p.

Optical Detection of Intracellular Quantities Using Nanoscale Technologies

Sigaeva, A., Ong, Y., Damle, V. G., Morita, A., van der Laan, K. J. & Schirhagl, R., Jul-2019, In: *Accounts of Chemical Research*. 52, 7, p. 1739-1749 11 p.

Nanosensors for diagnosis with optical, electric and mechanical transducers

Munawar, A., Ong, Y., Schirhagl, R., Tahir, M. A., Khan, W. S. & Bajwa, S. Z., 27-Feb-2019, In: *RSC Advances*. 9, p. 6793-6803 11 p.

Toward Using Fluorescent Nanodiamonds To Study Chronological Aging in *Saccharomyces cerevisiae*

van der Laan, K., Naulleau, J., Damle, V. G., Sigaeva, A., Jamot, N., Perona Martinez, F. P., Chipaux, M. & Schirhagl, R., 20-Nov-2018, In: *Analytical Chemistry*. 90, 22, p. 13506-13513 8 p.

Two-dimensional nanomaterial based sensors for heavy metal ions

Gan, X., Zhao, H., Schirhagl, R. & Quan, X., Oct-2018, In: *Mikrochimica Acta*. 185, 10, 30 p., 478.

Interaction of nanodiamonds with bacteria

Ong, S. Y., van Harmelen, R. J. J., Norouzi, N., Offens, F., Habibi Najafi, M. B., Schirhagl, R. & Venema, I., 26-Sep-2018, In: *Nanoscale*. 10, 36, p. 17117-17124 8 p.

Instantaneous magnetic resonance spectroscopy of a sample

Chipaux, M. S. & Schirhagl, R., 12-Jul-2018, Patent No. WO2018128543, Priority date 6-Jan-2017

Nanodiamonds and Their Applications in Cells

Chipaux, M., van der Laan, K. J., Hemelaar, S. R., Hasani, M., Zheng, T. & Schirhagl, R., 14-Jun-2018, In: *Small*. 14, 24, 25 p., 1704263.

Fluorescent nanodiamonds: potential free radical detectors in live cells

Sigaeva, A., Hamoh, T., Perona, F. & Schirhagl, R., 20-May-2018, In: *Free Radical Biology and Medicine*. 120, p. S87-S87 1 p.

Nanodiamonds for In Vivo Applications

van der Laan, K., Hasani, M., Zheng, T. & Schirhagl, R., 9-May-2018, In: *Small*. 14, 19, 17 p., 1703838.

The Response of HeLa Cells to Fluorescent NanoDiamond Uptake

Hemelaar, S. R., Saspaanithy, B., L'Hommelet, S. R. M., Perona Martinez, F. P., van der Laan, K. J. & Schirhagl, R., 26-Jan-2018, In: *Sensors*. 18, 2, 15 p., 355.

Method and detector for microscopic measurement by means of a colour center

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