2019 PDA EUROPE

Visual Inspection Week

22-24 MAY 2019
BERLIN, GERMANY
EXHIBITION: 22-24 MAY
TRAINING: 22-23 MAY
IG MEETING: 24 MAY

CONNECTING PEOPLE SCIENCE AND REGULATION®

Training

IG Meeting

SCHEDULE AT A GLANCE

22 May **23 May**	**9:00 – 18:00** **9:00 – 16:30**	**An Introduction to Visual Inspection**	**Two-Day Training Course**
22 May **23 May**	**9:00 – 17:30** **9:00 – 16:30**	**Mastering Automated Visual Inspection**	**Two-Day Training Course**
24 May	**10:00 – 17:00**	**IG Visual Inspection**	**Interest Group Meeting**

For latest information, please visit: **pda.org/eu/viweek19**


WELCOME TO
BERLIN

An Introduction to Visual Inspection

A hands-on training course

Overview

This training course covers the fundamentals of visual inspection methods and their application to injectable products. The detection and identification of visible particles is a key part of the course content, though container and closure defects are discussed as well. Attendees combine classroom review of current regulatory requirements and inspection methods with hands-on laboratory exercises to develop and practice practical inspection skills. The skills developed through this combination of classroom and laboratory exercises may be applied to manual human inspection, semi-automated and automated machine inspection methods. This is also an excellent opportunity to discuss your specific inspection questions and challenges with expert instructors.

Who Should Attend:

- Injectable Drug Product Manufacturing Professionals and Management
- Quality Professionals and Management
- Validation and Manufacturing Engineers
- Technical Support Staff
- Product Development Scientists
- Inspection Equipment Manufacturers

Learning Objectives:

Upon completion of this course, the attendee will be familiar with:

- Understand current global regulatory and compendial requirements for visual inspection
- Understand patient risk associated with visible particles in injections
- Implement a technically sound and compliant inspection process
- Assess inspection performance
- Have basic knowledge about computer vision

John G. Shabushnig, *PhD, Principal Consultant, Insight Pharma Consulting, LLC*

John Shabushnig is the founder of Insight Pharma Consulting, providing expert guidance in all aspects of visual inspection. He has over 30 years of industry experience starting as a Research Scientist at The Upjohn Company and most recently as a member of Pfizer's Global Quality Operations, where he was responsible for providing microbiology and aseptic manufacturing technical support. John holds a B.S. in Chemistry from Carroll College and a Ph.D. in Analytical Chemistry from Indiana University. He is an active member of the Parenteral Drug Association (PDA), having served on the Board of Directors (2003-2011) and as Chair (2008-2009) and is the founder and leader of the Visual Inspection Interest Group. He serves on the United States Pharmacopeia (USP) Dosage Forms Expert Committee and chairs the Visual Inspection of Parenterals Expert Panel. He has published and presented numerous papers on the subjects of spectroscopic analysis, process analytical technology (PAT), rapid microbiological test methods and the visual inspection of pharmaceutical products.

Markus Lankers, *PhD, MIBIC*

Markus is one of the co-founders of MIBIC GmbH that develops rapid bacteria identification systems. Within MIBIC Markus is responsible for research and development of new spectroscopic methods for bacteria analysis. He has 25 years of experience in the field of particle identification. In 2002, he founded rap.ID Particle systems GmbH and served as Managing Director until the sale of the company in 2018. Prior to this position, he worked as a scientist in different development departments at Schering AG, Berlin, Germany. Markus holds a diploma in Chemistry and a Ph.D. in Physical Chemistry from the University of Würzburg. He is an active member of the Parenteral Drug Association (PDA). Since 2003, he has supported the 'Visual Inspection of Parenterals' Interest Group in Europe as Interest Group Leader. He has served as program co-chair for the PDA Visual Inspection Forum from 2001 to 2018 in Europe and the USA.

Wednesday, 22 May 2019 9:00 – 18:00

9:00 **Welcome and Introduction**
- Why We Inspect
- Patient Safety
- Regulatory Requirements
- Compendial Requirements

10:30 **Coffee Break**

11:00 **Inspection Methods and Technologies**
- Critical Parameters (lighting, time, contrast and motion)
- Manual Visual Inspection (MVI)
- Semi-Automated Visual Inspection (SAVI)
- Automated Visual Inspection (AVI)

12:30 **Lunch Break**

13:30 **Particle Identification**

14:30 **Laboratory Exercise: Manual Visual Inspection**
- Light Measurement
- Assessment effect of changing critical variables
  - Time (10 sec vs. 20 sec)
  - Lighting (2,500 lux vs. 1,250 lux)
  - Motion/Agitation (with vs. without)

15:30 **Coffee Break**

16:00 **Continue Laboratory Exercise**

17:30 **Wrap-up Discussion / Q&A**

18:00 **End of Day 1**

Thursday, 23 May 2019 9:00 – 16:30

9:00 **Inspection Data Review**
- From previous day's laboratory exercise

10:00 **Defect Classification Strategies**
- Risk Classification Definitions
- Critical, Major and Minor defects

10:30 **Coffee Break**

11:00 **Acceptance Sampling**
- Sampling Plan Variables
  - Sample Size
  - AQL and UQL
- Common Standards
  - ANSI/ASQ Z1.4
  - ISO 2859

12:00 **Inspection Strategies**
- Reinspection
- 2-Stage Inspection
- Focused Inspection
- Empty Vial Inspection

12:30 **Lunch Break**

13:30 **Inspector Selection and Qualification**
- Vision Screening
- Initial Training
- Initial Qualification
- Requalification

14:00 **Inspection Validation**
- Inspection performance Assessment
  - Knapp Method
- Acceptance Criteria

14:30 **Coffee Break**

15:00 **Hot Topics from the 2019 Visual Inspection Forum**
- US FDA comments on visible particles and VI
- Application of AI/Deep Learning to VI
- Methods for Difficult to Inspect Parenteral (DIP) products
- Tracking and trending of VI data
- Clinical relevance of particles in injections

16:00 **Wrap-up Discussion / Q&A**

16:30 **End of Training Course**

Mastering Automated Visual Inspection

Overview

Visual Inspection mastery is fundamental in parenteral manufacturing in order to guarantee both patient safety and cost effective supply. The capability of Automated Visual Inspection (AVI) has progressed extensively over the years to the point where, when applied appropriately, it can offer significant advantages over manual and semi-automated inspection processes. This has been made possible thanks to major innovations and technology breakthroughs. In line with these technological advances, the regulatory requirements for this challenging process have been reinforced. As a consequence, AVI machines today are complex and require multidisciplinary project teams for successful implementation and to manage continous improvement. This course has been devised to support your AVI program development, by addressing critical parameters, key competencies and practical approaches to managing the inherent complexity of AVI. In day 1, after a review of regulatory landscape, key functions of AVI equipment and associated critical parameters will be covered. Then, the participants will look at the interaction between primary packaging component and AVI of the filled drug product. Successful URS development will be covered by a practical workshop in order to address not only user needs but also to produce a comprehensive process flow model. In Day 2, the need for an effective Manual Visual Inspection (MVI) baseline process will be overviewed as a prerequisite to AVI. Then, defect kits and validation strategies will be described. AVI has a scope broader than computer vision alone and the overall control strategy for the process will be covered. 'Vision Engineering for dummies' will be explained during a practical workshop using modern vision equipment and genuine examples of production defects.

Who Should Attend:

This course is designed specifically for those who are involved or interested in moving from manual to automated inspection like

- Managers, supervisors and all decision makers in the visual inspection area
- Quality personnel, Project and Qualification engineersl
- Prerequisites: Basic understanding and practical experience of manual inspection (as conveyed in the PDA course 'Introduction to Visual Inspection')

Learning Objectives:

Upon completion of this course, you will be able to:

- Acquire basics about regulatory landscape for AVI
- Be ready to design your URS
- Understand key function of AVI equipment
- Define your defect kits and validation strategy
- Develop your own control strategy around AVI
- Have basic knowledge about computer vision

Romain Veillon, *Senior Manager Visual Inspection & Leak testing, Global MSAT GlaxoSmithKline Vaccines*

Romain Veillon is Senior Manager Visual Inspection & Leak Testing at GSK Vaccines, in Global MSAT Manufacturing Technologies. Currently Romain focuses on Visual Inspection in a global function to support and advise GSK sites in the fields of Quality Integration Lead, Technology Development, Validation Strategy, Capability, Asset Management, Performance Improvement, and Develop Equipment Strategy. Furthermore, he is managing a network of vision experts to develop Visual Inspection expertise within GSK Vaccines. During the last 18 years he has worked in the area of parenteral manufacturing and has gained experience at Sanofi Pasteur, Eli Lilly and GSK Vaccines in different functions. Romain developed innovative vision systems with some academic collaboration and is a frequent speaker at PDA conferences.

Fernand Koert, *Consultant, Vision Technology, Dresden GlaxoSmithKline Vaccines*

Fernand was born in The Hague, Netherlands and studied electronics at the Technical University of Delft. Working in that field, he completed career stages from shift leader to assistant plant manager. After gaining extensive practical experience, he studied Process Technology at the Maritime Faculty in Amsterdam, graduating Cum Laude and worked as a process engineer there after. In 2000, Fernand became a freelancer helping companies to set up practical training programs for operators. At Teva Pharmaceuticals, he did the same and became head of the packaging department in 2003. In 2005, he returned to technical engineering by assuming responsibility for reshaping and automation of packaging lines. Since 2011, Fernand has been specializing in vision technology, improving and sampling for test kits and validation. In 2014, he moved to GSK, developing recipes for Seidenader AVI, first in Belgium, and currently for GSK in Dresden, Germany.

Wednesday, 22 May 2019 9:00 – 17:30

09:00 **Welcome & Introduction**

09:30 **Theory 1: Introduction Into Regulatory Requirements of Visual Inspection**
- USP 1, USP 788 and 1788, USP 790 and 1790
- PhEur e.g. 2.9.20
- JP e.g. 6.06
- Annex 1
- Similarities and differences in compendial methods
- 100% inspection and AQL testing
- Definitions and practical examples of inherent, intrinsic and extrinsic particles

10:45 **Coffee Break**

11:15 **Theory 2: Introduction Into Technical Principles of Automated Inspection Machines**
- Functionality of automated inspection machines
- Camera systems / light / motion
- Image processing and database system
- Interlinkage of parameters: Speed, Rotation speed, Inspection parameters, Detection probability, False reject rate
- Properties, capabilities and limitations of automated inspection systems
- Scope of Automated Visual Inspection

12:15 **Lunch Break**

13:15 **Theory 2: Introduction Into Technical Principles of Automated Inspection Machines (cont.)**

14:15 **Theory 3: Considerations on Primary Containers and Product Properties**
- Vials, Ampoules, Syringes, Blow – Fill - Seal, Viscous liquids, Air bubbles / scratches, Refrigerated product containers

14:45 **Exercise 1: Developing an URS Considering the Triangle Cost / Quality / Time**

15:45 **Coffee Break**

16:15 **Theory 4: Selection and Purchasing of an Automated Inspection System**
- Technical requirements
- Integration into existing processes, lines/ machines and systems
- Cost and effort considerations
- Risk assessment

17:15 **Exercise 1 (cont.): Presentation of the Results of the Sub-Groups and Discussion of the Results**

Q & A

17:30 **End of Day 1**

Thursday, 23 May 2019 9:00 – 16:30

09:00 **Recap of Day 1**

09:15 **Theory 5: Transition from Manual Inspection to Automated Inspection**
- Manual inspection as a prerequisite for transition to automated inspection
- Interpretation of inspection results and validation data
- Considerations on validation program for automated inspection
- Performance measurement
- Maintaining the manual inspection

10:15 **Exercise 2: Principle Basic Image Processing Using an Open Source Library**

11:00 **Coffee Break**

11:15 **Exercise 2 (cont.): Presentation of the Results**

12:00 **Theory 6: Qualification Test Set and Routine Test Set**
- Statistical considerations on number of objects containing defects
- Particle selection, particle size and size uniformity
- Labelling of test set objects
- Supply/purchase of test sets
- Maintaining and lifecycle of test sets
- Sampling from rejects
- Defect master library
- Types of defects
- Quality requirements

13:00 **Lunch Break**

14:00 **Theory 7: Visual Inspection Lifecycle and Control Strategy**
- Integration of visual inspection into overall manufacturing process
- Elements of lifecycle
- Particle identification/characterization
- Defect libraries as dynamic database
- AQL and control charting

15:00 **Theory 8: Operation and Maintenance of Automated Inspection Systems**

15:30 **Coffee Break**

16:00 **Future Trend of Automated Visual Inspection**

16:30 **End of Training Course**

Visual Inspection

Focus Topic: Novel Digitalization Approaches and Applications of Deep Learning

Dear Colleagues,

Digitalization and artificial intelligence will prospectively reshape many concepts and ways of working linked to visual inspection. The coming years will be fascinating with the emergence of new technologies.

Applying deep learning algorithms to automated visual inspection has become a terrific opportunity for improved classification and highly precise detection of damages and defective pharmaceutical products.

We will try to answer questions about where we stand today and what can be expected in the future. We need to reflect on how to support this transition; what architecture, organization and capabilities should be developed. Besides this, a stunning question remains to be pursued: how to validate this approach?

We are excited to announce our **2019 Visual Inspection Interest Group Meeting** with the main focus on **Novel Digitalization Approaches and Applications of Deep Learning.**

The PDA Interest Groups are discussion forums, each with a highly focused topic of interest. The main idea behind this workshop is to engage in questions raised by attendees and to have a more in-depth discussion compared to the usual presentation-driven meetings. You are invited to contribute and provide your questions to the group, and together develop possible solutions to these challenging issues. Industry experts will be participating to help facilitate the discussion.

As a thematic framework, the IG Leaders have chosen the following topics for this exciting workshop:

Brief introduction to tools and technologies of digitalization and deep learning

What benefits does it have to offer?

How will our ways of working be reshaped?

What validation strategies can be used?

What can we learn from other similar technologies?

Short presentations covering additional information fitting the scope of the Interest Group are very welcome.
Please contact schubach@pda.org to submit your topic proposal.

We look forward to welcoming you to Berlin!

Sincerely,

John G. Shabushnig, *PhD,*
Insight Pharma Consulting, IG Lead US

Romain Veillon,
GlaxoSmithKline Vaccines, IG Lead EU

Friday, 24 May 2019

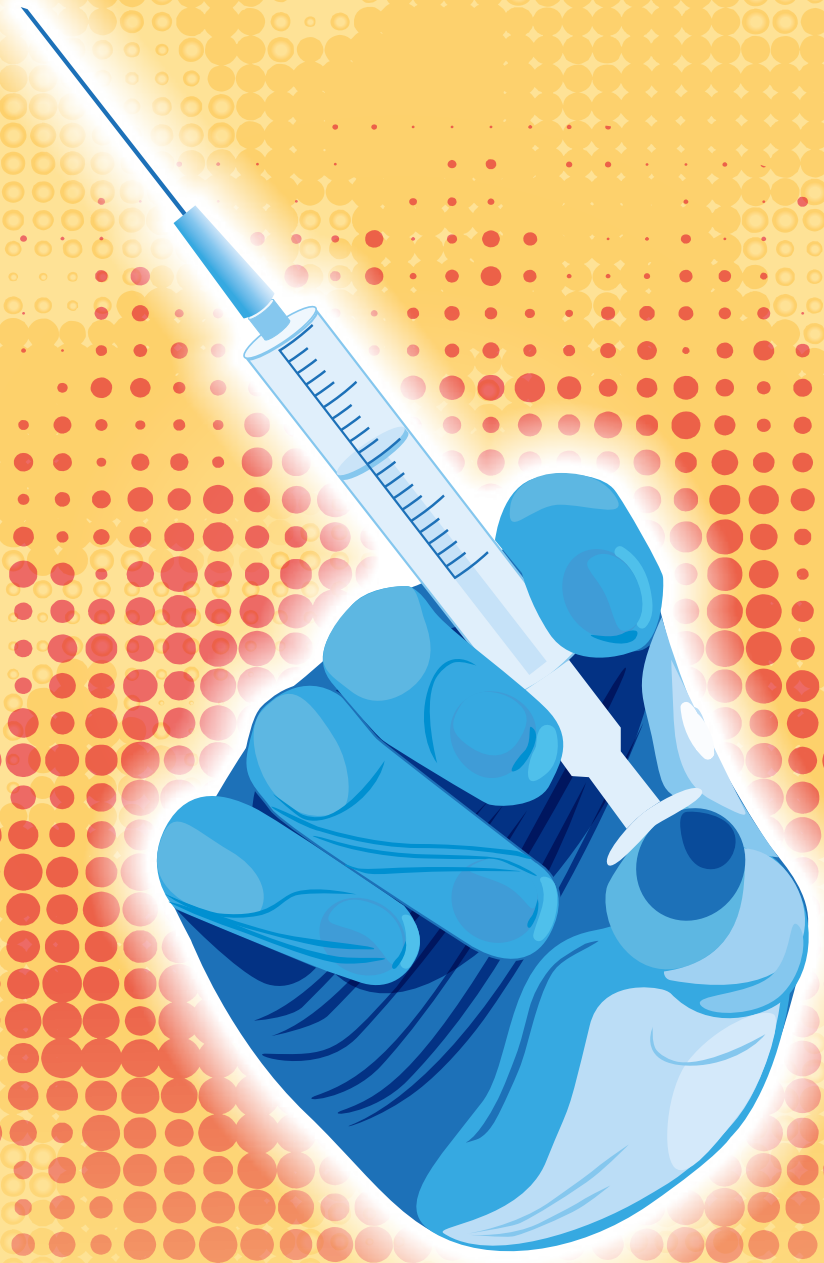
10:00	**Welcome and Introduction** • Benefits of the PDA Interest Group • PDA Connect	Falk Klar, *PDA Europe* John Shabushnig, *Insight Pharma Consulting* Romain Veillon, *GSK Vaccines*
10:15	**Keynote: Challenges and Opportunities for Deep Learning within the Pharma Industry**	Romain Veillon, *GSK Vaccines* Adriano Biocchi, *MVTech*
	Interactive Discussion	
11:30	**Coffee Break, Poster Session & Exhibition**	
	Data Integrity and Validation in Visual Inspection	
12:00	**How to Validate Deep Learning Approaches**	Romain Veillon, *GSK Vaccines*
	Group Discussion • Challenges of the implementation of data integrity • Validation – A comparison of AVI and MVI and will the MVI baseline remain? • Critical parameters for AVI validation • Risks associated to deep learning model validation	
13:30	**Lunch Break, Poster Session & Exhibition**	
	Current Challenges in Automated Visual Inspection	
14:30	**Automated Visual Inspection in the Revised Annex 1 Guideline**	John Shabushnig, *Insight Pharma Consulting*
	Group Discussion • Annex 1 – what the revised guideline entails for AVI? • Regulatory issues with new technologies • How to use stored images • The importance of test sets • How the future will be shaped by deep learning approaches	
15:30	**Coffee Break, Poster Session & Exhibition**	
16:00	**Hot Topics from the 2019 Visual Inspection Forum** • US FDA comments on visible particles and VI • Application of AI/Deep Learning to VI • Methods for Difficult to Inspect Parenteral (DIP) products • Tracking and trending of VI data • Clinical relevance of particles in injections	
16:20	**Summary of the IG Meeting and Take-Home Messages**	Romain Veillon, *GSK Vaccines* John Shabushnig, *Insight Pharma Consulting*
17:00	**End of IG Meeting and Farewell**	Romain Veillon, *GSK Vaccines* John Shabushnig, *Insight Pharma Consulting* Falk Klar, *PDA Europe*

PDA
Parenteral Drug Association

pda.org/eu/particles2019

2019 PDA EUROPE

Particles in Injectables



24-25 SEPTEMBER 2019
BERLIN, GERMANY
EXHIBITION: 24-25 SEPTEMBER
TRAINING: 26-27 SEPTEMBER

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MARK YOUR CALENDAR

VENUE

Courtyard by Marriott Berlin City Center
Axel Springer Strasse 55
Berlin 10117
Germany
Tel: + 49 30 80 09 28 0
https://goo.gl/bJ2oJi

Special Rates
PDA Europe has reserved a limited number of bedrooms until **8 April 2019.** Book your room for the PDA Group Rate.

Single Room 135 € per night*
Double Room 150 € per night*

*Rates are per room and night, including the following services and benefits free of charge:

- Buffet Breakfast in the restaurant
- usage of Wireless LAN
- VAT, Taxes and Service will apply

Housing at the selected hotel will be in high demand, so we strongly recommend making your reservations early.

DIRECTIONS

© Google For directions click on the picture, scan the QR-code or go to **https://goo.gl/maps/5R3jUubo9LD2**

CONTACT INFORMATION

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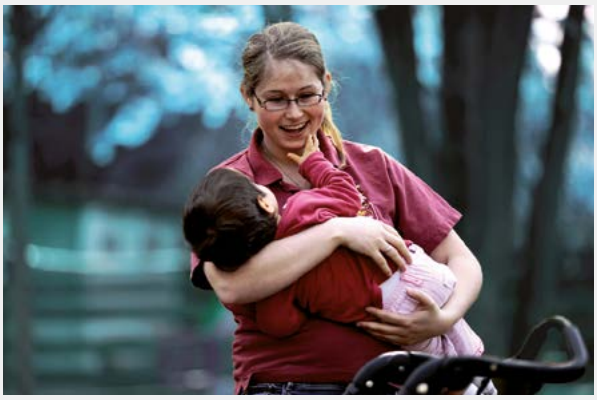
TO EXHIBIT:

PDA meetings and conferences are a great opportunity for your company to gain on-site exposure in front of highly-qualified, upper-level professionals in the pharmaceutical and biopharmaceutical industry. Exhibition and Sponsorship Opportunities are available. For this event we offer a special 3-for-2 discount: Basic exhibition package for 3 days (Educational Program & IG Meeting) is priced **1.895 € net (table-top).** For more information please contact: **expo-europe@pda.org**

SPECIAL REQUIREMENTS

If you require special accommodations to fully participate, please attach a written description of your needs with your registration form. Specific questions can be directed to registration-europe@pda.org.



PDA Europe supports the children's hospice „Sonnenhof"

The Sonnenhof Hospice, located near PDA's office in Berlin, offers support and assistance to families with children suffering from incurable and/or debilitating diseases. At Sonnenhof, children, together with their families, can spend the time they have left as they wish and find some relief from their suffering. Instead of purchasing expensive gifts for the conference speakers, PDA has decided to donate this amount to the Sonnenhof Hospice. You can also contribute and help us increase the amount, it is easy:

buy a package of chewing gums at the registration desk. THANK YOU!

To know more about the Sonnenhof Hospice, please visit **www.bjoern-schulz-stiftung.de**

Björn Schulz STIFTUNG
Für eine Zeit voller Leben

22-24 May 2019 | Berlin | Germany

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Your registration is only complete upon filling in and submitting both pages of this form.

1 Registration

22-23 May	**Two-Day Training Course**	**Training Course Fee**	
Mastering Automated Visual Inspection		**All Participants**	☐ **1595**
22-23 May	**Two-Day Training Course**	**Training Course Fee**	
An Introduction to Visual Inspection		**All Participants**	☐ **1595**
24 May	**Interest Group Meeting**	**Meeting Fee**	
IG Visual Inspection		**All Participants**	☐ **350**

Your consent is important. We manage your personal data responsibly.
For more information, please visit pda.org/privacy-policy

RESPONSE REQUIRED – By checking the box(es) below, I consent to:

☐ My contact information (name, company, job title, city, state, country) being printed on the attendee list distributed at the event.

☐ PDA recording and/or photographing me and using those recordings and/or photographs in future PDA promotional and marketing materials.

☐ PDA sending me promotional information via email.

☐ PDA sending me promotional information via post

The fee includes event documentation as well as mid-session refreshments and lunch. Excellent networking opportunities with snacks and drinks will be given. The fee does not include the hotel accommodation. PDA Europe has secured a limited number of rooms at a special group rate.

This PDF-file provides an automatic fill-in function. Your signature, however, is needed in writing.

22-24 May 2019 | Berlin | Germany

3 WAYS TO REGISTER

1. **online: pda.org/eu/viweek19**
2. **FAX: + 49 30 436 55 08-66**
3. **Email: registration-europe@pda.org**

2 Your Contact Information

If this form is an update to a previously submitted form, please check here. ☐

☐ Mr. ☐ Ms. ☐ Dr. ☐ Nonmember ☐ **I want to become a PDA Member.**

Name (Last, First, MI) ☐ PDA Member ID Number

Job Title

Company Department

Mailing Address

City Postal Code

Country Email

Business Phone Fax

☐ Substituting for

(Check only if you are substituting for a previously enrolled colleague; a nonmember substituting for member must pay the membership fee.)

3 Information about Visa Matters

- All registrations which will involve visa matters will have to be submitted to PDA EU four weeks prior to the start of the event at the latest. For later registrations, PDA Europe will be unable to assist participants in any visa affairs.
- All costs incurring in connection with visa affairs shall be borne by registrants. (This applies in particular to costs for submitting documents by courier.)
- Potential participants must be clients of UPS shipping agency and submit their UPS customer reference number to PDA EU (together with their registration).

4 Payment Options

☐ **By Bank Transfer**

Beneficiary: PDA Europe gGmbH

IBAN: DE73 1007 0024 0922 8735 00

BIC (SWIFT-Code): DEUTDEDBBER

Bank Address:

Deutsche Bank, Welfenallee 3-7,
D-13465 Berlin, Germany

☐ **By Credit Card**

☐ American Express ☐ MasterCard ☐ VISA

For your credit card information safety:
Please send your details by fax only (+49 30 4365508-66)
or register online.

☐ **Purchase Order**

Purchase Order Number

Billing Address: ☐ Same as contact information address above.
If not, please send your billing address to: petzholdt@pda.org

Your Company VAT I.D.:

This number starts by your country code with two characters
(example: PDA Europe's country code starts with: DE | followed by the number)

PDA Europe VAT I.D.: DE254459362

Your registration is only complete upon filling in and submitting both pages of this form.

Date Mandatory Signature

CONFIRMATION: Transmitting your filled-in registration form constitutes a binding application for the specific event. PDA Europe will send you a confirmation including payment details. **A legally binding contract is concluded once PDA Europe has sent a written invoice by mail to you.** A payment confirmation will be sent to you within one week once payment has been received. You must have this written confirmation to be considered enrolled for this PDA event. PDA Europe reserves the right to deny access to anyone unable to provide written confirmation that all dues have been fully settled. **SUBSTITUTIONS:** If you are unable to attend, substitutions are welcome and can be made at any time, including on site at the prevailing rate. If you are registering as a substitute attendee, please indicate this on the registration form. Changes are free of charge until 2 weeks prior to the start of the event. After this two-weeks period, there will be a charge of € 100 excl. VAT per name change. **REFUNDS: Refund requests must be sent to PDA Europe.** If your written request is received on or before **28 April 2019** you will receive a full refund minus a 150 € excl. VAT handling fee. After that time, no refund or credit requests will be approved. If you are an unpaid registrant and do not attend the event, you are responsible for paying the registration fee. On-site registrants are not guaranteed to receive conference materials until all advanced registered attendees receive them. PDA Europe works PCI-Compliant. **EVENT CANCELLATION:** PDA reserves the right to modify the material or speakers/instructors without notice, or to cancel an event. If an event must be canceled, registrants will be notified by PDA as soon as possible and will receive a full refund. PDA will not be responsible for airfare penalties or other costs incurred due to cancellation. For more details, contact PDA at **registration-europe@pda.org or fax to +49 30 4365508-66.**

PDA EUROPE EVENTS

2019

16-17 May	**Pharmacopoeia**	* **Geneva, Switzerland**
22-24 May 24 May	**Visual Inspection Week** Interest Group Meeting Visual Inspection	* **Berlin, Germany**
4-5 June	**Advanced Therapy Medicinal Products**	* **Vilnius, Lithuania**
24 June 24 June **25-26 June**	Workshop: The Digital Robot Pharma Fab Interest Group Meeting Quality Systems **4th PDA Europe Annual Meeting**	**Amsterdam, The Netherlands**
2 September **3-4 September** 5 September	Interest Group Meeting Freeze Drying **BioManufacturing** Interest Group Meeting Vaccines	* **Munich, Germany**
2 September **5 September**	Interest Group Meeting Technology Transfer **Project Management in the Pharmaceutical Industry**	* **Munich, Germany**
24-25 September	**Pharmaceutical Freeze Drying Technology**	* **Berlin, Germany**
24-25 September	**Particles in Injectables**	* **Berlin, Germany**
21 October 21 October 21 October **22-23 October**	Workshops: Innovating the Journey from Manufacturing to the Patient Innovative Drug Delivery Systems/Combination Products Impact of Pre-filled Syringe Components on Biopharmaceuticals **The Universe of Pre-filled Syringes and Injection Devices**	* **Gothenburg, Sweden**
12-13 November	**Pharma Logistics & Outsourced Operations**	* **Lisbon, Portugal**

Subject to change | For latest info: **europe.pda.org** | Shortlist 9 May 2019

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