

**Workshop 4-6 April 2023, Nijmegen, the Netherlands**

**The transition towards sustainable pharmaceuticals –  
assessing sustainability, from design & production to  
prescription & use**



The meeting will be held at hotel [Van der Valk](#) Nijmegen-Lent.

## Tuesday April 4, afternoon (day 1)

Chair: Ad Ragas (Radboud University)



### Moving towards the design of active pharmaceutical ingredients (APIs) with less impact on the environment after use

12:00	<b>Registration and lunch</b>
13:00	<b><i>Plenary session (Room 3 Waalsprong)</i></b>  Ad Ragas (Radboud University, the Netherlands) – Welcome, Introduction to the PREMIER project, setup and goal of the meeting  Gerd Maack (UBA, Germany) - Setting the scene: the need to design greener APIs  Robert Sheppard (AstraZeneca, Sweden) Introduction - overview of the drug R&D process
14:00	<b>Interactive intermezzo</b>
14:20	<b><i>Plenary session (Room 3 Waalsprong)</i></b>  Neele Puhmann (Leuphana University, Germany) - Outcomes of the interviews and workshop with R&D experts  Irene Bramke (Astra Zeneca, UK) - Applying environmental hazard criteria in the R&D process: testing candidate substances.  Tobias Pamminger (Bayer Crop Science, Germany) - The implementation of environmental criteria in crop protection product R&D
15:20	<b>Break</b>
15:50	<b><i>Interactive session in subgroups</i></b>  <b>Rooms 4 and 11:</b> What are the needs of R&D organisations to embrace the challenge to design greener APIs? <b>Rooms 3 and 5:</b> How can stakeholders from the healthcare sector implement use of greener APIs?
17:00	<b><i>Plenary feedback and discussion (Room 3 Waalsprong)</i></b>
17:45	<b>End of day 1</b>
19:00	<b>Dinner at Humphrey's, sponsored by GSK</b> (Mariënborg 59, 6511 PS Nijmegen) <a href="https://www.humphreys.nl/en/restaurants/humphreys-nijmegen">https://www.humphreys.nl/en/restaurants/humphreys-nijmegen</a>

## Wednesday April 5, morning (day 2)

Chair: Caroline Moermond (RIVM)



### Environmental criteria for active pharmaceutical ingredients to reduce their impact after use

9:00	<p><b>Welcome (Room 3 Waalsprong)</b></p> <p>Caroline Moermond (RIVM, the Netherlands) - Welcome, introduction to today's meeting</p>
9:10	<p><b>Plenary session (Room 3 Waalsprong)</b></p> <p>Caroline Moermond (RIVM, the Netherlands) - GREENER criteria for sustainable active ingredients; possibilities for risk mitigation</p> <p>Klaus Kümmerer (Leuphana University, Germany) - Reducing environmental persistence</p> <p>Bastiaan Venhuis (RIVM, the Netherlands) - PFAS pharmaceuticals</p> <p>Tiina Sikanen (University of Helsinki, Finland) – Bioaccumulation in aquatic species</p> <p>Irene Bramke (AstraZeneca, UK) - Mobility</p>
10:30	<p><b>Break</b></p>
11:00	<p><b>Plenary session (Room 3 Waalsprong)</b></p> <p>Andreas Häner (Roche, Switzerland) - Ecotoxicity</p> <p>Jim Ryan (GSK, UK) - How criteria for environmental properties and criteria for efficacy and safety interact</p> <p>Ross Brown (University of Exeter, UK) - Tools and assays to predict environmental properties</p>
11:50	<p><b>Discussion in subgroups (Rooms 3 - 6)</b></p> <p>Criteria to reduce environmental impact of APIs after use</p>
12:40	<p><b>Lunch</b></p>

## Wednesday April 5, afternoon (day 2)

### PREMIER parallel session

Chair: Caroline Moermond (RIVM)



#### Implementation of environmental criteria in drug discovery and design of small molecules

13:30	<p><b><i>Interactive session (Room 6 de Warmoes)</i></b></p> <p>Implementation of environmental criteria in drug discovery and design of small molecules</p> <ul style="list-style-type: none"><li>- Your view on sustainability in early small molecule R&amp;D</li><li>- Barriers for implementation of environmental criteria in the R&amp;D process</li><li>- What are windows of opportunity? What would be drivers?</li><li>- What do R&amp;D experts need from environmental experts?</li></ul>
15:00	<p><b><i>Plenary discussion (Room 6 de Warmoes)</i></b></p>
15:15	<p><b><i>Wrap-up, future work</i></b></p>
15:30	<p><b>End of PREMIER part; Drinks in Lola's bar</b></p>
18:30	<p><b>Dinner at De Hemel</b> (Franseplaats 1, 6511 VS Nijmegen) <a href="https://restaurantdehemel.nl/en/">https://restaurantdehemel.nl/en/</a></p>
21:00	<p><b><i>Serious Game on Safe and Sustainable by Design</i></b> Restaurant De Hemel (Franseplaats 1, 6511 VS Nijmegen) <a href="https://restaurantdehemel.nl/en/">https://restaurantdehemel.nl/en/</a></p> <p>We will play a serious game on SSbD. Within the TransPharm project, we intend to change this game to focus on pharmaceuticals. All input appreciated!</p>

## Wednesday April 5, afternoon (day 2)

### TransPharm parallel session

Chair: Ad Ragas (Radboud University)



#### Criteria for greener production of pharmaceutical products

12:30	<b>Registration and lunch</b>
13:40	<b><i>Plenary session (Room 3 Waalsprong)</i></b>  Ad Ragas (Radboud University, the Netherlands) – Welcome, introduction to this session  Lowik Pieters (RIVM, the Netherlands) - First inventory of stakeholder views on criteria  Rosalie van Zelm (Radboud University, the Netherlands) - Introduction on LCA aspects; differences between active ingredients, materials, products, etc.
14:30	<b>Interactive intermezzo</b>
14:50	<b><i>Plenary session (Room 3 Waalsprong)</i></b>  Lieselot Boone (Ghent University, Belgium) - Case study on LCA  Wouter de Soete (Johnson and Johnson Ghent, Belgium) - Generating actionable insights through environmental impact assessment: challenges and opportunities  Alex Mullen (AstraZeneca, UK) - Product Sustainability Index – Driving Innovation for Sustainable Medicines Production
15:50	<b>Break</b>
16:20	<b><i>Plenary discussion (Room 3 Waalsprong)</i></b>
16:50	<b><i>Plenary interactive session</i></b>  Is there a business case for Green pharmaceuticals?
17:30	<b><i>Plenary wrap-up</i></b>
17:45	<b>End of day 2</b>
18:30	<b>Dinner at De Hemel</b> (Franseplaats 1, 6511 VS Nijmegen) <a href="https://restaurantdehemel.nl/en/">https://restaurantdehemel.nl/en/</a>
21:00	<b><i>Serious Game on Safe and Sustainable by Design</i></b> Restaurant De Hemel (Franseplaats 1, 6511 VS Nijmegen) <a href="https://restaurantdehemel.nl/en/">https://restaurantdehemel.nl/en/</a>  We will play a serious game on SSbD. Within the TransPharm project, we intend to change this game to focus on pharmaceuticals. All input appreciated!

## Thursday April 6 (day 3)

Chair: Caroline Moermond (RIVM)



### Sustainability assessment of pharmaceutical products

8:30	<b>Registration</b>
9:00	<b><i>Plenary session (Room 3 Waalsprong)</i></b>  Caroline Moermond (RIVM, the Netherlands) - Welcome, Introduction to the TransPharm project, setup and goal of the meeting  Jen Hochmuth (HealthCare without Harm, Belgium) - Need for sustainability assessment; Sustainable public procurement of pharmaceuticals  Ad Ragas (Radboud University, the Netherlands) - Re-cap of day 2: criteria for APIs after use and criteria for sustainable APIs/products  Lisa van Wilder (Ghent University, Belgium) - Mapping of the value chain, introduction of handprint/footprint concept
10:10	<b>Break</b>
10:40	<b><i>Interactive session in subgroups</i></b>  <b>Rooms 3 and 5:</b> Topic A. Mapping the life cycle of pharmaceuticals and needs for an assessment system by stakeholders: Who, why?  <b>Rooms 6 and 7:</b> Topic B. Aspects to consider when designing an assessment system for environmental sustainability of pharmaceuticals
12:10	<b>Lunch</b>
13:00	<b><i>Interactive session in subgroups</i></b>  <b>Rooms 3 and 5:</b> Topic A. Mapping the life cycle of pharmaceuticals and needs for an assessment system by stakeholders: Who, why?  <b>Rooms 6 and 7:</b> Topic B. Aspects to consider when designing an assessment system for environmental sustainability of pharmaceuticals
14:30	<b>Short break</b>
14:45	<b><i>Interactive session in subgroups</i></b>  <b>Room 6:</b> Needs and opportunities for education and awareness raising in drug R&D  <b>Room 3:</b> Education of healthcare professionals: needs, best practices, opportunities
15:45	<b><i>Plenary wrap-up (Room 3 Waalsprong)</i></b>
16:00	<b>End of day 3 – Drinks in the Foyer!</b>