MistraPharma

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Pollution by antibiotics promotes bacterial resistance – risks for human health?

MistraPharma researchers at the Universities of Gothenburg and Umeå have previously shown that direct releases of pharmaceuticals from manufacturing sites can be an important pollution source. A major concern is that antibiotic pollution will promote resistance in environmental bacterial communities; resistance that might spread to bacteria that cause disease in humans.

Photo: Joakim Larsson

River in Patancheru, India, heavily polluted from releases of wastewater from bulk drug production.

Earlier this year, the Gothenburg and Umeå researchers showed that the release of considerable amounts of antibiotics from an industrial wastewater treatment plant into a river in India does indeed promote antibiotic resistance in the bacterial communities living downstream of the plant (Kristiansson et al, PLoS ONE 2011; 6: e17038). This was shown by comparing the abundance of genes associated with resistance to that of less antibiotic contaminated areas in the region and in Sweden. Moreover, mobile genetic elements were more abundant in the heavily polluted sites, suggesting a risk that the resistance may spread to other bacteria.

Ongoing projects aim to study if the resistance is spreading to humans living close to the polluted river. Human gut flora has already been sampled from people living in villages close to or further away from the polluted river.

In MistraPharma phase 2, studies are proposed to evaluate whether different wastewater treatment technologies promote resistance to different degrees. Also, further studies of places of varying antibiotic pollution in both Sweden and India are planned, in order to determine the environmental concentration of antibiotics that is required for promoting resistance.

Anna Johnning
Joakim Larsson
University of Gothenburg

New sustainability criteria for procurement of pharmaceuticals

The Swedish Environmental Management Council's (SEMCo/Miljöstyrningsrådet) procurement criteria on pharmaceutical products now cover social responsibility and environmental procedures in the supply chain. SEMCo is the Swedish government's expert body on environmental and other sustainable procurement.

The updated criteria were re-launched in January this year, and include social requirements based on the international ILO conventions as well as environmental procedures covering harmful emissions, raw material and hazardous substances in pharmaceuticals. The criteria already covered availability of environmental information in the fass.se guidelines in this area.

The procurement criteria are available in English and Swedish at: www.msr.se/en/green_procurement/criteria/Nursing-and-care/Pharmaceuticals/

"The supplier must prove that there are routines in place for improved environmental and social responsibility. The criteria are about putting routines in place, such as self assessments, which will support suppliers in improving their work", says Maria Azzopardi, project manager for pharmaceuticals at SEMCo.

Photo: Trons

Maria Azzopardi

For more information, please contact Maria Azzopardi at maria@msr.se or on +46-(0)8-7006696.

Hanna S Backman
SEMCo/Miljöstyrningsrådet

A green pricing and reimbursement system for pharmaceuticals

All the different stakeholders in the health care sector agree that environmental issues related to pharmaceutical manufacturing, distribution and use are important and a number of initiatives are being undertaken. MistraPharma is extremely important in order to develop the scientific foundation for these initiatives.

As a result of discussions held at the MistraPharma/ Svenskt Vatten joint seminar "From Tablet to Toilet" in January, LIF, the association for the research based pharmaceutical industry in Sweden launched one of these initiatives. On March 28th, 2011, LIF invited stakeholders to a round-table discussion on criteria for "green" pharmaceuticals and "green" economic incentives. The meeting discussed potential changes in the pricing and reimbursement system, including decisions regarding patented products as well as the mandatory generic substitution to the "product of the month". The discussed changes would present some kind of benefit for "green" products versus "non-green" products.

But what is a "green" product? Which criteria should be evaluated? The round-table meeting launched two working groups, one working on "Green criteria and environmental assessments of pharmaceuticals", and the other one looking into costs and other aspects of changes to the pricing and reimbursement system. The working groups will present their results at a new round-table gathering scheduled for September 28th.

For more information, read my meeting reports at: www.ansvarsbloggen.se, entries of March 28th, April 20th, May 11th and May 17th.

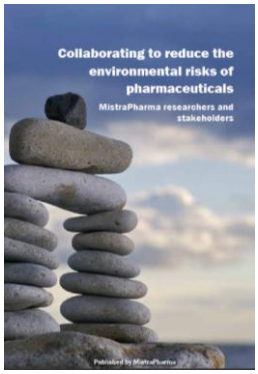
Bengt Mattson
CSR and Environmental Affairs Manager
Pfizer AB

Summarising the achievements of MistraPharma phase 1

The MistraPharma programme is approaching the end of its first phase, and I would like to highlight some of our most important contributions to the research field:

- Direct release of pharmaceuticals from production sites is the source for the highest levels of pharmaceuticals in the aquatic environment. (Fick et al, Environ Toxicol Chem 2009; 28: 2522).
- The synthetic hormone levonorgestrel bioconcentrates more than predicted in fish. (Fick et al, Environ Sci Technol 2010; 44: 2661).
- Levonorgestrel is a potent and efficient developmental toxicant in female frogs. (Kvarnryd et al, Aquat Toxicol 2011; 103: 18).
- The reporting of non-standard studies needs to be significantly improved in order to facilitate their use for regulatory risk assessment. (Ågerstrand et al, Environ Sci Eur, in press).
- The MistraPharma database WikiPharma (Molander et al, Regul Toxicol Pharmacol 2009; 55: 367) is continuously updated and considered a useful tool for environmental risk assessments of pharmaceuticals.

Moreover, during these years Sweden has become a strong international actor and driving force concerning pharmaceuticals in the environment, and a close cooperation has been developed between Swedish scientists and stakeholders in this field. We like to think that the MistraPharma programme has contributed significantly to this development.



Several examples of how MistraPharma research benefits stakeholder organisations can be found in the recently released MistraPharma annual book "Collaborating to reduce the environmental risks of pharmaceuticals". The book can be downloaded in Swedish or English from www.mistrapharma.se, O§r ordered from info@mistrapharma.se.

In conclusion, MistraPharma phase 1 has generated important results and we hope to be able to continue this work for four more years.

Christina Rudén
The programme director for MistraPharma

We wish you all a relaxing and wonderful summer!

Karin Liljelund, Vendela Roos and Helene Hagerman

If you have any questions you are welcome to contact us!
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