

# Nemera

## EXPANDING CONNECTIVITY: ADD-ONS FOR OPHTHALMIC AND NASAL DELIVERY

It's no secret that connectivity is the next big thing in drug delivery device design. In this article, Nemera introduces the company's latest offering in this space, the e-Novelia® and e-Advancia® add-ons for ophthalmic and nasal devices.

### INTRODUCTION

The drive towards connected healthcare has become a well-established facet of current drug delivery device development, the overwhelming potential benefits having led to an explosion of development projects aiming to create connected devices. The rationale behind this surging trend is by now equally well established, being based on the concurrent shift towards self-administration and advanced delivery systems, the booming biologics and specialty pharma sectors, and the enormous loss in revenue from patient non-adherence, estimated to have been US\$637 billion (£469 billion) in 2016 by Capgemini Consulting. These factors all feed into one another and, in turn, into connected devices.

Another factor is the excitement around connectivity is how readily the groundwork is laying itself. Smartphones are already widely used in Europe and the US, to the point of feeling ubiquitous in some

areas, and worldwide penetration is heading towards 50%. The wellbeing market, being far less stringently regulated than healthcare and thus having a head start experimenting with connectivity, shows that a significant portion of the population are more than willing to integrate apps and devices, Fitbit being a noteworthy example, into their daily lives. Harnessing this appetite for technology to serve the goals of healthcare would be an enormous boon to the industry.

The advantages that electronics and connectivity can provide at the device level, especially for self-administration, are well trod ground. In summary the major points are:

- Better communication with the user via electronic instructions for use (IFU), dedicated smartphone app, digital reminders, etc.
- Feedback on use technique/training.
- Data harvesting to enable analysis by patients, pharma and healthcare professionals.

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Generally speaking, there are two methods of approach for developing connected devices: integration and add-ons. Both routes have their distinct advantages and disadvantages, with examples of both being widespread in development projects throughout the industry, primarily in the injection and pulmonary spaces. At present, Nemera has projects pursuing both approaches. This article will focus on Nemera's add-on

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Figure 1: e-Novelia®, connected add-on for ophthalmic delivery.



Figure 2: e-Advancia®, connected add-on for nasal delivery.

technology for the Novelia® multidose eyedropper (see *ONdrugDelivery Magazine*, Issue 82 (Jan 2018), pp 16–20), and the Advancia® nasal spray (see *ONdrugDelivery Magazine*, Issue 85 (Apr 2018), pp 4–8).

## NEMERA'S CONNECTED OPTHALMIC & NASAL ADD-ONS

### e-Novelia®

Utilising a multi-skilled team across mechanical, electronic and software development, Nemera has developed e-Novelia® (Figure 1), a smart add-on device for the established Novelia eyedropper. The rechargeable and reusable e-Novelia boasts several advanced features:

- Sensors, including shaking, tilt, actuation, temperature and drop detection
- User interface, including a screen and buzzer/vibrator
- Mechanical improvements, including an ergonomic nozzle and bottle squeezing aid
- Drug identification using near-field communication (NFC)
- Connectivity via Bluetooth and smartphone.

e-Novelia was developed with issues and challenges specific to ophthalmic delivery in mind. Whilst seemingly simple, actually utilising an eyedropper successfully and accurately is somewhat difficult. There are common problems that an electronic smart device is uniquely positioned to tackle, including accurate targeting of the eyedropper. The standard Novelia goes some way to solving this with its signature blue dot, but with digital enhancement the e-Novelia can go the whole way, using sensors to detect when the inclination of the device is correct and signalling this to the user via a green light. The e-Novelia also provides a visual stimulus during

“e-Advancia features the full suite of features: reminders, shaking sensors, digital display, dose counter, posology indication, buzzer/vibrator, reminders and connected app.”

application to assist the user in keeping the eye open and digital readouts give feedback on the dose delivered and amount of medication remaining.

That being said, the greatest advantage of the e-Novelia, as expected of a connected device, is its ability to communicate with a smartphone app. This ability enables a slew of further features, including adherence monitoring, dosage history, digital tutorials, medication reminders and social network integration. The app also provides a more user-friendly interface for e-Novelia's readouts, such as dosage detection, battery life, eyedropper shelf-life/expiry and remaining volume. Finally, smartphone connectivity enables a “Find My Device” feature to help find e-Novelia when it has been misplaced.

### e-Advancia®

Using Nemera's wealth of development and innovation knowledge, Nemera's high performance nasal pump, Advancia, has also received an electronic add-on. As with e-Novelia, e-Advancia® (Figure 2) is a reusable, rechargeable add-on device for an already established product. e-Advancia also features the full suite of features: reminders, shaking sensors, digital display, dose counter, posology indication, buzzer/vibrator, reminders and connected app.

## CONCLUSION

Nemera has brought its extensive experience and know-how to bear in the field of connectivity, developing connected add-

ons for its Novelia and Advancia drug delivery platforms. The ophthalmic and nasal delivery routes rarely receive the same attention in the connectivity world as the pulmonary and subcutaneous, and these devices rise to meet that unmet need.

To make them the most attractive possible offering, e-Novelia and e-Advancia feature off-the-shelf technological bricks (sensors, motors, wireless, etc), patient integration during the development process, GMP for electronic manufacturing and regulatory support.

## ABOUT THE COMPANY

Nemera is a world leader in the design, development and manufacture of drug delivery devices for the pharmaceutical, biotechnology & generics industries. Nemera's services and products cover several key delivery routes:

- Parenteral (autoinjectors, pens, safety devices & implanters)
- Ophthalmic (multi-dose, preservative-free eyedroppers)
- Nasal, buccal, auricular (pumps, valves and actuators for sprays)
- Inhalation (pMDIs, DPIs)
- Dermal and transdermal (airless & atmospheric dispensers).

Nemera always puts patients first, providing the most comprehensive range of devices in the industry, including innovative off-the-shelf systems, customised design development, and contract manufacturing.

