# LondonPharma

LondonPharma is a privately owned UK biopharmaceutical research and development company with a successful track record of product development; repurposing existing drugs for sublingual delivery.

The company has product development programmes underway in various indications including cancer (LON002 in Phase Ib/IIa clinical trials), Lyme disease, blood-fluke, inflammation, erectile dysfunction, pain, addiction and nausea using its repurposing expertise for sublingual delivery.

## Repurposing existing drugs

In the face of ever increasing drug development costs and risk; repurposing existing drugs for use in new disease areas or enhanced use (with increased speed of action, increased bioavailability or increased patient compliance) offers product life cycle opportunities for both branded and generic drugs.

*According to the Pharmaceutical Research and Manufacturers of America 2013 Profile, bringing a single new drug to market costs $1.2 billion.*

*According to the US FDA, it takes on average 12 years for an experimental drug to progress from bench to market.*

*The North American and European pharmaceutical industries invest more than $20 billion per year to identify and develop new drugs. Of 5,000 compounds that enter preclinical trials, only five on average are tested in human clinical trials and only one of those five receives approval for therapeutic use.*

*Source: Accelerating drug discovery Kraljevic, Stambrook and Pavelic, EMBO reports*

Repurposed drugs can yield new patent estate, patent extensions to existing drugs or an increased market size.

## Sublingual delivery

Absorbing drugs through the oral mucosa, sublingually, has numerous advantages over alternative routes such as orally or intravenously.

1. Medication can be used that would normally have an adverse effect upon the gastrointestinal tract.

2. Less medication is needed because the sublingual route bypasses absorption in the gastrointestinal track and metabolism in the liver.

3. A faster onset of action results which is particularly beneficial in the treatment of acute conditions such as pain, erectile dysfunction, nausea or an allergic reaction.

4. The medication is easy to administer and provides more accurate dosing for patients who have difficulty in swallowing oral drugs or who lack capacity.

5. It is pain free. The oral mucosal membranes are not disrupted.

6. Drinking water is not needed.

## Successful track record of product development

Founded in 2007, LondonPharma initially demonstrated its expertise in repurposing through the sublingual delivery of a treatment for severe malaria in children.
A separate joint venture company has since been formed with a partner to commercialise the use of the drug in this indication.

### *How does LondonPharma create Intellectual Property?*

*REPURPOSING is the application of the existing drug (knowledge of its physico-chemical properties) + (combined with) carrier (knowledge of its physico-chemical properties) + (combined with) mode of delivery (spray) + LondonPharma's know how that enables the change in therapeutic use or enhanced use.*

*It is the company's ability to combine these aspects that creates Intellectual Property.*

## Intellectual Property

**Artemisinins:** LondonPharma has a strong portfolio of patents covering the use of artemisinins in sublingual and other formulations.

**Carrier:** LondonPharma has a patent covering its current carrier with a range of compounds.

**Device:** LondonPharma's repurposed drugs work in a range of commercially available, multi-shot devices. LondonPharma has developed a single-shot sublingual spray delivery system for which the patent is pending.

**LondonPharma intends to prosecute its intellectual property in all markets of interest. LondonPharma will vigorously defend its intellectual property.**

## LondonPharma's product pipeline

LondonPharma has drug development programmes underway in various indications as follows:

| Artemisinin-based drug candidates | Preclinical | Phase I | Phase Ib/IIa | Phase III | Approval |
|---|---|---|---|---|---|
| cancer - LON002 | → | → | → | | |
| Lyme disease - *Borreliosis* | → | → | | | |
| blood-fluke - *Schistosoma* | → | | | | |

| Drug candidates based on repurposed existing drugs | Blood Level Studies | Bioequivalence | Approval |
|---|---|---|---|
| generic and branded drug to treat erectile dysfunction | → | | |
| opioid to treat cancer breakthrough pain | → | | |
| generic drug to treat nausea | → | | |
| generic and branded drug to treat high cholesterol | → | | |
| opioid to treat addiction | → | | |

**LondonPharma's strategy** is to take its product development programmes through to *proof-of-efficacy* in man and then license those programmes to corporate partners.

**LondonPharma's business model** is semi-virtual, combining the in-house development of the core delivery technology and science with the out-sourcing of specialist biology, toxicology, regulatory and clinical development programmes.

**LondonPharma's Therapeutic Indication Advisory Boards** will be developed and expanded for each programme under development. This will include both internal and specific external specialists.

**LondonPharma is based** in two main locations; its corporate head office is in Oxford, UK and its laboratories at the Innovation Centre, Norwich Research Park, Norwich, UK.

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*"If the current use of a proven, existing drug or treatment is restricted by its initial design and delivery, there is a great opportunity to repurpose that drug for new and enhanced use. LondonPharma's application and know how can open up exciting new therapeutic areas, increase speeds of onset and patient compliance and can grow market size."*

*David Laskow-Pooley*
*Chief Executive Officer,*
*LondonPharma*

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