

Remedium universalis

A decade ago, the completion of the Human Genome Project was completed. This has sparked optimism that cures for debilitating diseases were within reach. But here we are, starting to organise trips to the moon and yet we have still not managed to find a universal silver bullet technique ... a medicinal product which possesses efficacy, safety and selectivity with minimal side-effects ... rather than guided missiles, today's medicines seem more like cluster bombs!

When it comes to the side-effect profile there are however some exceptions to this. These include Doxil® which was initially authorised twenty years ago in the US for the treatment of Kaposi's sarcoma. It basically enveloped the active ingredient in a liposome which in turn was impregnated with a hydrophilic polyethylene glycol (PEG) layer. However the technology still lacked one important aspect of drug delivery ... selectivity. Nowadays researchers are looking at ways in which the active ingredient, following encapsulation in a biodegradable polymer which delays the release of the drug, is surrounded with a PEG layer which has an outer layer of targeting antibodies. Since the polymer envelope is made up of more than one single component (unlike liposomes) it is possible to alter its constitution, thus modulating the release of the active ingredient.

Furthermore, the inclusion of the targeting antibodies adds selectivity to the whole process. Obviously this technique holds the key for the future ... theranostics.

There are also technological innovations taking place in parallel, which also prove to be equally interesting. An example is the development in 2012 of a screening test which enables doctors to test a tumour sample for 280 different genetic mutations suspected of causing tumour growth. The test, launched a year ago by Foundation Medicine Inc (US) has yielded surprising results. For example, in one recent case, a woman suffering from advanced pancreatic cancer tested positive for Her-2, an alteration associated with a HER-2 positive breast tumour! She was subsequently treated effectively with Herceptin®.

Other recent medical advances are also being observed in mobile technology. The AliveCor Heart Monitor® has been developed by AliveCor (www.alivecor.com) and authorised by FDA (US) as an iPhone add-on which allows doctors to carry out an ECG almost anywhere. It basically consists of a case, costing €150, which snaps onto an iPhone, with electrodes on the back. It is able to record, display, store, and transfer single-channel ECG rhythms.

On the other hand, CellScope (www.cellscope.com), a mobile health

company based in San Francisco, developed the CellScope Otoscope®. This is a special case featuring a protruding head, which attaches itself over an iPhone. This enables doctors to perform ear examinations using the iPhone, after which the images can be analysed using the cellscope application. Similar technologies include the iExaminer®, consisting of an iPhone Ophthalmoscope (developed by Welchallyn, www.welchallyn.com); an iPhone blood pressure monitor (developed by Withings, www.withings.com); an iPhone digital stethoscope (developed by Thinklabsmedical, www.thinklabsmedical.com); and MobiUS SP1®, consisting of a hand-held ultrasound probe transducer (developed by MobiSante, www.mobisante.com). In the latter case the use of the device is not limited to iPhones. Hopefully more devices which can be used for different types of smartphones are developed! S

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