Intercell AG: a multitude of technology platforms. Product-related revenue now needed.

LONDON, UK----15 May 2008----ExpertREACT. At its recent R&D day Vienna-based Intercell AG announced progress of its diverse vaccine pipeline and current corporate strategy. A key highlight was the announcement to acquire USA-based Iomai Corporation. **VacZine Analytics** discusses the strategic rationale behind the move but recognizes that the company will truly "come of age" when its JEV vaccine (partnered with Novartis Vaccines) is approved in EU and US markets later this year.

Intercell AG is a fast-growing vaccine company based in Vienna. Despite being relatively small (250 employees), and not yet having a licensed product, the company has a product development pipeline (16 projects) and alliance structure which almost mirrors much larger vaccine rivals. Recently the company has also announced a new acquisition of Maryland-based Iomai Corporation in an all cash merger of approximately $190 million (1). The Iomai acquisition provides Intercell with numerous strategic options namely; a further technology platform focused on needle-free delivery and Phase II Traveler's Diarrhea and pandemic influenza vaccine programs.

Since its foundation in 1998 Intercell has established a good position by effectively marketing its two key vaccine innovation platforms to larger partners. The first platform known as "AIP" or Antigen Identification Platform is a laboratory-based process whereby Intercell's scientists identify antigens of an infectious pathogen which raise a protective immune response in convalescing patients. The "high priority" antigens are then isolated and after production of larger quantities, are tested in preclinical animal models to verify whether they can be vaccine candidates.

Because Intercell files intellectual property (IP) coverage on discovered antigens it can then offer partnership to large companies which then fund the expensive clinical development program. A good example of this arrangement is the partnership with Merck & Co which gained access to Intercell's proprietary *Staphylococcus aureus* (Staph) *antigen*, IsdB. If the Staph vaccine, which is currently in Phase II/III trials is successfully marketed Intercell will be entitled to royalty payments so forming a potential future revenue stream. Using the AIP technology, Intercell has also identified potential vaccine antigens to numerous other bacterial pathogens such as Group A and Group B *Streptococcus*, *Streptococcus pneumoniae* and other selected nosocomial pathogens.

Intercell's second key technology platform is proprietary "next generation" adjuvant IC-31. IC-31 is a synthetic mixture of the cationic antimicrobial peptide, KLK and the immunostimulatory oligonucleotide (ODN1a, TLR-9 agonist). Importantly, IC-31 can stimulate T-cell and B-cell responses, notably the Th1 response which is critical for immunodefence against chronically infecting, intracellular pathogens. Like antigens derived from the AIP program, Intercell has secured potential royalty streams from IC-31 use by larger companies in their new vaccine programs. For example, Wyeth has licensed IC-31 use for a variety of undisclosed programs and Novartis Vaccines is testing the adjuvant in a Phase I influenza program. At this stage it is difficult to gauge the relatively potency/quality of the IC-31 response compared to other new adjuvants e.g. MF59 and QS-21 and potential cost implications but it at least appears that larger companies are willing to fund the studies. IC-31 is also being used in HCV and TB vaccine programs.

The recent announcement to acquire Iomai Corporation gives Intercell access to a third key vaccine technology platform i.e. needle-free or patch delivery. The technology relies on the concept of transcutaneous immunization (TCI) whereby vaccine antigens, possibly with adjuvants are delivered to the antigen presenting cells (APC) of the skin epidermis/dermis which then stimulate a strong immune response. The concept of TCI has been mooted for many years since the much hyped "Powderject era" but now with the filing of Sanofi's intradermal flu microinjection product in the EU (1) and this latest acquisition **VacZine Analytics** believes the field is experiencing resurgence.

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Intercell state that the Iomai patch technology is "best in class" and has wide applications on new and existing vaccines because of its convenience, high safety profile and ability to stimulate a stronger response with lower antigen quantities. Indeed, the patch technology appears particularly suited to small molecular weight protein antigens which mainly arise from the Intercell AIP platform.

The Iomai patch technology could strengthen Intercell's emerging travel franchise which is critical to the company's near-term position. Although Intercell has a strong cash position, revenues from the company's flagship product, the Japanese Encephalitis vaccine (Ixiaro, partnered with Novartis) are needed to fund the company's significant R&D expenses which increased 40% over Q1 2007.

Ixiaro is now due for approval in the US, EU and Australia in 2008 but with a 2-dose formulation has a potential weakness compared to the competing one-dose Sanofi/Acambis ChimerVax-JE. Although Sanofi have not yet exercised the US-option for the product they appear to be increasing their commitment to the endemic region especially in India (2). For the Western traveller's market it is plausible that the Iomai technology could form a defense strategy converting Ixiaro to a more convenient one-dose product.

The acquisition of Iomai's Traveler's Diarrhea (TD) vaccine (Phase II) has obvious synergy with Ixiaro because it has the same target population. Although traveler's diarrhea is not associated with the same level of morbidity/mortality as JEV, there is undoubtedly higher awareness of its impact on traveler health. Moreover, it is estimated to affect more people (~55m) over a wider range of destinations. The TD vaccine has been shown in Phase II studies to have a good safety/efficacy profile in preventing diarrhea due to E.coli (ETEC) which is responsible for 40-50% of cases. Intercell/Iomai are betting that the lack of current competition and high product convenience will make the TD vaccine a bigger product than Ixiaro. **VacZine Analytics** also believes it is likely that Novartis Vaccines will eventually market the TD vaccine since they are conducting pre-launch activities for Ixiaro and are keen to build their travel franchise.

While on paper Intercell's acquisition of Iomai has many strategic advantages. It allows the company to mature beyond a licensing driven business model. However, the deal brings many project specific risks and challenges. After witnessing many failed marketing attempts of enhanced delivery mechanisms, the commercial viability of the patch-technology can easily be challenged. In addition, it is well known that budget conscious travelers avoid expensive vaccinations even for diseases with a more serious outcome e.g. hepatitis A and JEV itself.

To summarize, it is most likely that larger vaccine players also considered the Iomai acquisition. Novartis Vaccines, which owns around 15% of Intercell is possibly taking a "wait and see" approach on the delivery technology. Aside from the science, with so many strategic options now available to Intercell, **VacZine Analytics** believes the key challenge will be selecting the right future path and staying focused.

References:

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VacZine Analytics is a new strategic research agency based in the United Kingdom. Its aim is to provide disease and commercial analysis for the vaccine industry and help build the case for developing new vaccines.