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Introduction

Plants are an abundant source of pharmaceutical products, whose healing properties are presumably known for about 50,000 years since the age of Neanderthal men (Gwynn, J. 2000). This until now unbroken tradition of folk medicine, which has developed independently in every society, is even today under improvement applying the local biodiversity. This long standing experience is the basis of a broad foundation of trust. Hence, approximately 60% of the world's population rely almost entirely on plants for medication (Harvey 2000). The high efficiency of natural products is documented through the fact, that about 33% of best-selling and 39% of new pharmaceuticals are based on natural origin. Classical examples are aspirin from *Salix spec.*, atropine from *Atropa belladonna*, digoxin from *Digitallis lanata* and colchicine from *Colchicum autumnale*, as well as newer developments like galanthamine from *Galanthus woronowii* (Alzheimer's disease), artemisin from *Artemisia annua* (Malaria), podophylotoxine from *Podophyllum peltatum* and taxol from *Taxus brevifolia* (anticancer; Fig. 1).

Fig. 1: Examples of plant derived pharmaceutical products
Structures and source plant



Basis

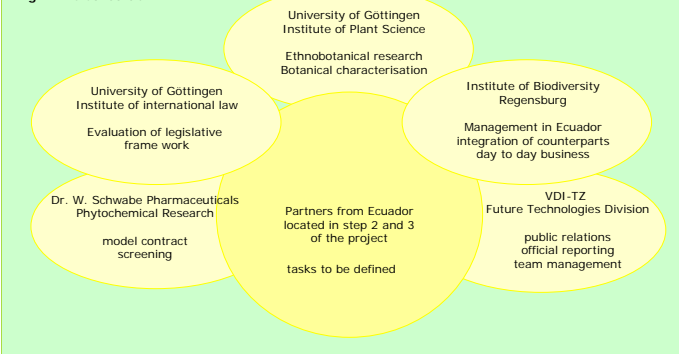
The convention of biological diversity (Rio 1992) determined that every country keeps sovereign rights about its biological resources and should therefore take care on conservation and sustainable use. If countries with high biological diversity allow foreign partners the use of its biological resources in any context, then there must be an adequate compensation, which may include benefit sharing, capacity building, know-how-transfer etc. The basic anticipated effect of the CBD to maintain biological diversity through a controlled gentle use of biological resources sticks, because there are either no manageable legislative regulations or unrealistic expectations about benefit-sharing, that underscore the high risk of investments necessary in pharmaceutical research.

Today, a climate of suspicion and mistrust rules the whole biological research and prevents especially small and medium sized companies from an engagement.

Objective

Central aim of the integrative research project is the documentation of a representative transparent process, that enables an international cooperation for a sustainable use of biological resources under acceptable benefit-sharing conditions.

Fig 2: The Consortium



Concept

To establish a trustful and successful cooperation in such a multidisciplinary and multicultural model project, it is absolutely necessary to monitor, balance and adjust many divers political, administrative and legal levels, which are almost out of the capabilities of a medium sized company. Therefore ProBenefit takes together expertise not only in botanical, chemical, pharmacological and medicinal research, but also includes sociological and legal knowledge (Fig. 2) to support and maintain interdisciplinary communication. The project is divided into 5 steps (Fig. 3). There are three stages: Orientation, Initialisation and Negotiation (for details see other posters), which will on success accomplish the consortium with Ecuadorian partners and establish a research contract that enables the plant research at Schwabe (mile stone). The screening phase will start with ethnobotanical surveys, selection of promising plants and preparation of extracts, that will be forwarded to a primary screening in standardised *in vitro* or *in vivo* pharmacological test systems, dependent on the collected ethnomedicinal information. Compared to the properties of pharmaceutical products in use, extracts with potent activities will be transferred to standard phytochemical characterisation to allocate new interesting natural products. Subsequently, these entities will be isolated by chromatography, characterised by physical and chemical methods, incorporated into a more general pharmacological classification and used as lead compounds for the preparation of optimised extracts, monitored by established analytical methods. Finally there will be a standardised extract with well defined properties that may be the basis for further clinical research and lastly the development of a pharmaceutical product.

Fig. 3: Project flow and expanded screening process



Literature:

Gwynn J, Hylands PJ. Plant as a source of new medicines. *Drug Discovery World Summer*. 2000, 54-59.
Harvey A. Strategies for discovering drugs from previously unexplored natural products. *Drug Discovery Today*. 2000, 5, 294-300.

Websites:

www.schwabe.de; www.schwabepharma.com; www.pro-benefit.de

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