TD 4 Correction

Impact of Flatworms Infections on Human Health

Question:

Supposing that you are preparing a review article about the impact of flatworms infections on human health, write an introduction that subject to the scientific writing rules.

- Instructions:
- Respect the initial steps of writing an introduction of a review article (introducing the topic, why is this topic interesting/significant, what do we know about it so far, how has the field progressed, what has the new progress shown?, article's scope)
- Use references
- Use different types of adverbs mainly conjunctive adverbs
- Use the appropriate verb tenses

Correction:

The following are two introductions extracted from review articles entitled: "Helminth Infections—The Great Neglected Tropical Diseases" and "Free-living flatworms under the knife: past and present" respectively, with their list of references.

Introduction 1:

Helminth parasites are parasitic worms from the phyla Nematoda (roundworms) and Platyhelminthes (flatworms) (Figures 1 and 2); together, they comprise the most common infectious agents of humans in developing countries. The collective burden of the common helminth diseases—which range from the dramatic sequelae of elephantiasis and blindness to the more subtle but widespread effects on child development, pregnancy, and productivity—rivals that of the main high-mortality conditions such as HIV/AIDS or malaria [1]. For example, based on a recent analysis [2], 85% of the neglected tropical disease (NTD) burden for the poorest 500 million people living in sub-Saharan Africa (SSA) results from helminth infections. Hookworm infection occurs in almost half of the poorest people in SSA, including 40–50 million school-aged children and 7 million pregnant women, in whom it is a leading cause of anemia. Schistosomiasis (192 million cases) is the second most prevalent NTD after hookworm, accounting for 93% of the world's number of cases of schistosomiasis and possibly associated with increased horizontal transmission of HIV/AIDS. Lymphatic filariasis (46–51 million cases) and onchocerciasis (37 million cases) are also widespread in SSA, each disease

representing a significant cause of disability and reduction in the region's agricultural productivity. The disease burden estimate in disability-adjusted life years (DALYs) for total helminth infections in SSA is 5.4–18.3 million in comparison to 40.9 million DALYs for malaria and 9.3 million DALYs for tuberculosis. Yet, research into helminth infections has not received nearly the same level of support. This is partly because helminthiases are diseases of the poorest people in the poorest regions, but also because these pathogens are difficult to study in the laboratory by comparison to most model eukaryotes and many other pathogens. Standard tools and approaches, including cell lines, culture in vitro, and animal models, are generally lacking. In addition, the genomes of helminths are generally much more complex than those of model organisms like yeast and fruit flies [2].

References:

1. Hotez PJ, Brindley PJ, Bethony JM, King CH, Pearce EJ, et al. (2008) Helminth infections: The great neglected tropical diseases. J Clin Invest 118: 1311–1321.
2. Hotez PJ, Kamath A (2009) Neglected tropical diseases in sub-Saharan Africa: Review of their prevalence, distribution, and disease burden. PLoS Negl Trop Dis 3: e412.

Introduction 2:

Regeneration research in flatworms has a long standing history, but was focussed on triclads since its beginning in 1774, when Pallas (Pallas 1774) described the regeneration of the triclads *Dendrocoelum lacteum* and *Bdellocephala punctata* (from Brøndsted 1969). Since then, a vast amount of studies about regeneration in flatworms has appeared (for recent reviews, see Agata and Watanabe 1999; Sánchez Alvarado 2000, 2003, 2004, 2006; Saló and Baguñà 2002; Newmark and Sánchez Alvarado 2002; Agata 2003; Agata et al. 2003; Reddien and Sánchez Alvarado 2004; Reuter and Kreshchenko 2004; Sánchez Alvarado and Kang 2005; Saló 2006), but many of the old questions and many of the most intriguing phenomena that have been discovered cannot be explained today. Why can some animals regenerate, while others cannot? How is the duplication of heads or tails (heteromorphoses) possible in adult organisms? What conditions are sufficient and what are necessary for successful regeneration? Is regeneration a side-product of asexual reproduction, or the other way round? Is regeneration recapitulating pathways used in embryonic and postembryonic development? How are stem cells controlled and directed in regeneration? Are stem cells in adult flatworms totipotent, and can they be likened to embryonic blastomeres? This review provides a brief synopsis on what is known about the regeneration capacity in free-living flatworms, and addresses open questions about

regeneration, with special emphasis on an emerging model organism, *Macrostomum lignano* (Egger et al. 2006a,b).

A comparison of the regeneration capacity of the macrostomorph flatworm *M. lignano* with other free-living flatworms necessarily involves a look at their phylogenetic relationship. The Macrostomorpha belong to the largest taxon Rhabditophora, which also encompasses the Polycladida, Lecithoepitheliata, Prolecithophora, Proseriata, Bothrioplanida, Tricladida, Rhabdocoela, and the parasitic Neodermata (Ehlers 1985; Rieger 1996; Tyler et al. 2006). Macrostomorpha are considered to be the most basal taxon within the Rhabditophora due to a simple pharynx, entolecithal eggs, and the lack of vitellaria (Ehlers 1985). Referring to their small size (millimeter range), macrostomorphans are members of the "microturbellarians", a nonsystematic denomination. Polyclads and triclads are the only taxa belonging to the "macroturbellaria", with forms generally in the centimeter range. Triclads, as more derived rhabditophorans, have vitellaria, a rather complicated embryonic development (e.g., Cardona et al. 2005) and an often very pronounced regeneration capacity (see Brøndsted 1969).

References:

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Egger B, Ladurner P, Nimeth K, Gschwentner R, Rieger R (2006a) The regeneration capacity of the flatworm *Macrostomum lignano*—on repeated regeneration, rejuvenation, and the minimal size needed for regeneration. Dev Genes Evol 216:565–577

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