signed bioreactor to build a 3D model of distal human lung with SCLC tumors. We found that SCLCs in the 3D model proliferated and invaded the microbeads and formed co-culture 3D tumors within a very short duration (72 h). We compared this bioengineered model with patient tumors and found it to reproducibly recapitulate the pathology and immunophenotyping of the patient tumors. When treated with dose courses of chemotherapy drugs, Cisplatin and Etoposide, alone or in combination, the model showed significantly higher drug resistance than the 2D cell cultures with a relapsing pattern similar to that of the existing PDXs. Being amenable to high throughput drug screening, this co-culture model can be a faster and advanced alternative to animal PDX models to study SCLC.

Presentation: Oral

153

Applying the 3Rs principles in wildlife research through non-invasive methods

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Research in ecology and wildlife biology remains crucial for increasing our knowledge and improving species management and conservation in the midst of the current biodiversity crisis. However, obtaining information on population status often involves invasive sampling of a certain number of individual animals. Marking and sampling practices include taking blood and tissue samples, toe-clipping of amphibians and rodents, or using implants and radio-transmitters – techniques that can negatively affect the animal. Wildlife research may then result in a fundamental conflict between individual animal welfare and the welfare of the population or ecosystem, which could be significantly reduced if non-invasive research practices were more broadly implemented. Implementation of non-invasive methods could be guided by the so-called 3Rs principles for animal research (Replace, Reduce, Refine), which were proposed by Russell and Burch more than 60 years ago (Russell et al., 1959) and have become a part of many animal protection legislations worldwide. However, the process of incorporating the 3Rs principles into wildlife research has been unfortunately rather slow and their importance overlooked (Zemanova, 2017, 2019). I will provide an overview of the most common practices in wildlife research, discuss their potential impact on animal welfare, and present available non-invasive alternatives (Zemanova, 2020).

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Presentation: Oral

155

A simple-to-use model to work purposeful and focused with culture of care

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Culture of Care can be a powerful and efficient tool to ensure, promote and advance animal welfare and the practical application of the 3 Rs – or it can be a meaningless phrase with no impact on these parameters. Approaches on how to work with Culture of Care has recently been published by Robinson et al. (2019) and Hawkins and Bertelsen (2019). Each user-establishment has its own and unique Culture of Care which requires a tailor-made attention to address the relevant challenges and issues.

This presentation takes the differences of each user-establishment into account and provides an universally applicable and operational overview of a working model of 1) how to assess the actual Culture of Care of the individual user-establishment and how to identify relevant topics and challenges required for change, 2) how to work determined and focused with Culture of Care by deploying different approaches at different levels to manage and direct the required initiatives for changes and 3) how to measure the effectiveness of the Culture of Care – and the effect of subsequent implemented changes – in terms of delivering a positive impact on animal welfare and the practical application of the 3 Rs, e.g., by using relevant Key Performance Indicators (KPIs). The model is simple and coherent and yet comprehensive as it covers the most relevant aspects of working with Culture of Care.

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