COHORT, we identified serum donors (n=526) that were cancer-free at least 10 years after sample collection. We extracted the serum RNA with a cut size optimised to cover RNA molecules from 17 to 47 nt in length. The total number of reads generated by the HiSeq 2500 (Illumina) platform was approximately 10 billion while the average sampling depths were 17.9 million raw reads per sample. We compiled a comprehensive set of annotations that covers both small regulatory ncRNAs (e.g. miRNA, piRNAs) and longer RNA (e.g. mRNAs, long ncRNAs) molecules.

**Results and discussions** We found a total of 258 miRNA, 441 piRNA, 411 tRNA, 24 small nucleolar (snRNA), 125 small nuclear (snRNA) and 123 misc-RNA genes that passed the expression threshold that we set (median expression ≥10 reads), representing the core circulating RNA expression profile of serum. We also identified 1642 isomiRs, isoforms of miRNAs, and 1900 different tRNA derived fragments, isoforms of tRNAs. These results show that human serum contains a rich repertoire of RNA molecules. We identified significant associations between all RNA classes and traits. Ageing showed the strongest association with RNA expression, both in terms of statistical significance and number of RNAs, regardless of RNA class. Smoking cessation generally restored RNA expression to non-smoking levels.

**Conclusion** Our results showed that most of the RNAs identified in serum are not random by-products but most likely have roles as circulating RNAs. Many have stable high expression and their expressions were associated with traits. Ageing is the strongest trait that influence circulating RNA profile and should be adjusted for in circulating RNA expression studies.

**PO-097 INTEGRATION OF DATA ACROSS TOXICITY ENDPOINTS TO EXPLORE NEW WAYS FOR CARCINOGENICITY SAFETY ASSESSMENT OF CHEMICALS**

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10.1136/esmoopen-2018-EACR25.624

**Introduction** Experimental methods for predicting the carcinogenicity of environmental chemicals have not been substantially updated in the last two decades whilst scientific knowledge of the potential health significance of human chemical exposure has been growing continuously. Available methodologies for the safety assessment of carcinogenicity are still driven by the identification of a genotoxic mechanism under the premise that any genotoxicant most likely can turn into a possible carcinogen. However, the vast majority of chemicals can act through multiple toxicity pathways, modes/mechanisms of actions to induce cancer over a specific threshold. Yet, more empirical data are needed to clarify the nature of the cancer dose-response relationship at low doses in the exposed human population. Several underlying mechanisms involved in the promotion and development of cancer which have been recently identified as well as tools to analyse them (mechanism-base tests, epigenetics, omics) have been hardly implemented so far as main components into the standard toxicology testing procedures or their integration is going at slow pace. Thus, a tool to guide the evaluation of carcinogenic hazard has been developed in order to facilitate the uptake and the integration of new mechanistic data by combining also information across different toxicity endpoints rather than considering them individually.

**Material and methods** The approach consists to map the available information from toxicity test methods across endpoints to the key characteristics of carcinogens as recently described by the International Agency for Research on Cancer (IARC) as a number of ways by which agents contribute to carcinogenesis. These mechanisms have been grouped in 10 main categories linked to the hallmarks of cancer as defined by [Hanahan & Weinberg (2000, 2011)]. Test methods are then dissected in a reverse-engineered manner to allow the overall information across to be organised in a systematic way which can help the description and comparative evaluation of the toxicity mechanisms leading to the adverse outcome.

**Results and discussions** The tool is able to recapitulate toxicity effects of chemicals, as from standard procedures and can help to the identification of redundancies, eventually limiting factors or gaps which can be integrated by new data.

**Conclusion** This integrated approach results in a set of options, motivated by a mechanistic understanding of the toxicological effects and their inter-relationships, for waiving redundant testing (long-term studies).

**Clinical Prevention Studies**

**PO-098 PREVALENCE OF HEAD AND NECK CANCERS, AND TOBACCO USE AMONG MALAYALI TRIBES, YELAGIRI HILLS, TAMIL NADU, INDIA**

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10.1136/esmoopen-2018-EACR25.625

**Introduction** Health is a state of complete wellbeing free from any discomfort and pain. Despite remarkable world-wide progress in the field of diagnostic, curative and preventive medicine, still there are large populations of people living in isolation in natural and unpolluted surroundings far away from civilisation, maintaining their traditional values, customs, beliefs and myths. India has the second largest tribal population of the world next to the African countries. About half of the world’s autochthonous people live in India, thus making India home to many tribes which have an interesting and varied history of origins, customs and social practices. The present study was conducted to assess the tobacco use, awareness and its effect on health among Malayali tribes, Yelagiri Hills, Tamil nadu, India.

**Material and methods** The inhabitants of the 14 villages of the Yelagiri hills, who have completed 18 years and residing for more than 15 years present on the day of examination and who were willing to participate in the study were included.

Data was collected from a cross-sectional survey, using a Survey Proforma, clinical examination and a pre-tested questionnaire which included Demographic data, tobacco habits. An intra-oral examination was carried out by a single examiner to assess the Oral Health Status using WHO Oral Health Surveys – [Basic Methods Proforma (1997)]. SPSS version 15 was used for statistical analysis.

**Results and discussions** Results showed that among 660 study population, 381 (57.7%) had no formal education. Among the study population 75% had the habit of alcohol consumption. Of those who had the habit of smoking, 26% smoked beedi,
10.9% smoked cigarette, 65% chewed raw tobacco, 18% chewed Hans and 28% had a combination of smoking and smokeless tobacco usage. The reason for practicing these habits were as a measure to combat the cold, relieving stress and body pain after work, and the lack of awareness of the hazards of the materials used. Prevalence of oral mucosal lesions in the study population was due to tobacco usage and alcohol consumption and lack of awareness regarding the deleterious effects of the products used.

**Conclusion** From the results of this study it may be concluded that the Malayali tribes were characterised by a lack of awareness about oral health, deep rooted dental beliefs, high prevalence of tobacco use and limited access to health services.

**Poster Presentation: Prevention and Early Detection**

**PO-101 RELATION BETWEEN PSA LEVEL, ITS DYNAMICS AND PERFORMANCE OF 18F-CHOLINE PET-CT IN RECURRENT PROSTATE CANCER**

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**Introduction** PET-CT using 18F-choline is widely used in diagnosis of prostate cancer local recurrence and metastases, whereas Prostate Specific Antigen (PSA) measurement is routinely used for biochemical monitoring. The purpose of our study was to evaluate performance of PET-CT with 18F-choline in relation to the PSA level or its change in time, in patients with biochemically diagnosed recurrent prostate cancer.

**Material and methods** 263 consecutive prostate cancer patients with elevation of PSA after treatment were included into the study. PSA values were evaluated at the time of PET scan (not more than 30 days before) and the PSA level change (∆PSA) was calculated as a per month difference between two recent measurements. PET-CT was performed using Discovery IQ scanner (GE Healthcare), 3 and 20 min after injection of 18F-choline (3 MBq/kg). Data are shown as median values (quartiles).

**Results and discussions** In 164 patients, in whom PET-CT scan was positive and has shown local recurrence or metastases both the PSA level [5.85 (2.09; 17.37)] ng/ml and ∆PSA [0.54 (0.06; 2.00)] ng/ml/month were significantly (p<0.01) higher than in 99 subjects with negative PET-CT: 1.23 (0.25; 3.59) ng/ml and 0.00 (-0.11; 0.10) ng/ml/month, respectively. The ROC curve analysis has indicated that PSA level of 1.70 ng/ml and ∆PSA of 0.12 ng/ml/month are the optimal cut-off values, with sensitivity 80, 9% and 70,2% and specificity 69.1% and 84.3%, for PSA and ∆PSA respectively.

**Conclusion** Diagnostic performance of 18F-choline PET-CT in patients with recurrent prostate cancer is dependent on the level of PSA and its change in time. The calculated cut-off values can be used to select patients who would benefit from PET-CT.