An overview of the research studies supported by our LC-MS/MS assays.

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SUMMARY
Cotinine is a metabolite of nicotine and its presence in biological fluids indicates nicotine intake. Colin Feyerabend has been supporting smoking research since the 1970s. We still support passive smoking research by measuring cotinine in saliva. We have been assaying saliva samples for the Health Survey of England since 1998 and trends of children’s exposure to second-hand tobacco smoke exposure has recently been summarised in a paper published in Addiction (1).

The validation of smoking cessation using cotinine alone is becoming increasing difficult with the massive expansion of the use of E-Cigs and over-the-counter NRT. In this situation measuring anabasine and cotinine in saliva has proved to be very useful as the presence of anabasine indicates that any cotinine levels present has come from tobacco rather than E-Cigs or NRT. The biochemical verification of smoking cessation by the analysis of anabasine and cotinine in saliva samples now enables stop smoking advisors to help with the treatment of their patients and to evaluate the success of their intervention approach to smoking cessation. (2)

Assays for nicotine in plasma, cotinine and 3-hydroxy cotinine in saliva and HPMA in urine are being applied to a variety of E-Cig research. (3 to 5).

Measuring cotinine and 3-hydroxy cotinine in saliva during pregnancy and postpartum was an easy way to investigate when the metabolism of nicotine increased and decreased. (6)

Saliva collection
• ABS can supply saliva and urine collection kits.
• The analytes in saliva are stable at ambient temperatures for 14 days so the samples can be sent to us by post.
• If the subject is on NRT or using E-Cigs we can confirm that they are abstaining from tobacco use by measuring anabasine.

Best way to take a saliva sample is using a Salivette. (Sarstedt, Part No 51.1534, Tel No. +44 (0)116 235 9023.)

References

2) Brown, J., et al Internet-based intervention for smoking cessation (StopAdvisor) in people with low and high socioeconomic status: a randomised controlled trial. The Lancet 2014, http://dx.doi.org/10.1016/S2213-2600(14)01995-X. The biochemical verification of smoking status using anabasine and cotinine showed that StopAdvisor was more effective than an information-only website in smokers of low but not high, socioeconomic status. StopAdvisor could be implemented easily and made freely available, which would probably improve success rates of smokers with low socioeconomic status seeking online support.

3) Dawkins, L. & Corcoran, O., Acute electronic cigarette use: nicotine delivery and subjective effects in regular users. Psychopharmacology 2013, http://dx.doi.org/10.1007/s00213-013-3249-8. This study showed reliable nicotine delivery after acute use of a first generation device containing 18 mg/mL nicotine. The actual nicotine delivery in each individual was quite variable even though they were all using the same device.


5) Etter, J-F., Positive aspects of E-Cigs BMJ 2013:346:f3845 His research findings have shown: if the formulation is controlled they contain less carcinogens than tobacco; There’s no carbon monoxide generation; Nicotine delivery per puff is normally lower but similar to a cigarette and an E-cig is the closest mimic we have to smoking a cigarette.

6) Bowker, K. A. et al Changes in the rate of nicotine metabolism across pregnancy: a longitudinal study. 2015, Addiction 110(11), 1827-1832. Nicotine metabolism which uses the hepatic cytochrome, CYP2A6, appears to be faster during pregnancy; this faster metabolism is apparent from 18 to 22 weeks of pregnancy and appears to fall by 4 weeks after childbirth.