



BLOOD TEST TO PROVE EXPOSURE – URGENT REQUEST FOR FUNDING

Through your involvement with GCAQE and your individual union, you know that exposure to oil fumes supplied to the cabin and flight deck can cause serious neurological problems and can threaten flight safety. Some know this from personal experience, but anybody can research the many peer-reviewed papers plus the reports from aviation safety boards, manufacturers, and military investigators. **The problem is irrefutable, but time and again, airlines claim that affected crewmembers are either malingering or have an underlying medical condition independent of the aircraft**, enabling the airlines to deny the responsibility of lost wages and medical bills, not to mention cleaning the air supply. Since airlines need neither monitor contaminants in the air supply nor share aircraft mechanical records, they get away with denying the problem. Many affected crews are unable to prove exposure to oil fumes and are forced to leave the industry with serious health problems and limited – if any - employment options.

Clearly, if airlines are going to be under any pressure to prevent oil contamination of the air supply and to take responsibility for ill crews and passengers, **there needs to be a means to definitively prove exposure to oil fumes**. To this end, for the past three years, Prof. Clem Furlong and his research team at the University of Washington in the US have been working to deliver just that, per a request from GCAQE's own Captain Tristan Loraine.

Although alternative products are available, engine oils used on the commercial fleet worldwide contain 1-5% tricresylphosphates (TCPs) - highly toxic additives that reduce wear on the aircraft engine. When you are exposed to some of the forms of TCPs, your body converts them into a toxic metabolite called "CSP" or cresyl cyclic saligenin phosphate. CSP then "decorates" some of the enzymes in your blood, causing specific structural changes that can be measured. Proving exposure to TCPs makes sense because aviation engine oils are one of the few sources. Airlines can not claim that crewmembers were exposed to TCPs while gardening or working on their car, for example.

Prof. Furlong and his team are now in the final stages of identifying two of those "CSP-decorated" enzymes in the blood. One should be detectable in the blood for about a month after exposure, and another, for up to three months. These tests will not prove *how much* oil a person was exposed to, but they will prove that the person was exposed which is *very* important because it means that airlines can no longer deny exposure. Crewmembers can supply this proof of exposure to their physician(s) to make the case to their airline that their ill health is a result of exposure to oil fumes in the aircraft. **Can you imagine what will happen to the status quo of denial, especially when affected passengers start to request this blood test?** When completed, the impact of these blood tests will be dramatic.

What's next? Prof. Furlong and his team are working on an enrichment process to enhance the sensitivity of the blood tests and to decrease the sample preparation time which will reduce the cost of analysis when these tests are commercialized. Some of the steps in their research are less obvious, such as the need to generate heavy isotope-labeled proteins to serve as internal standards and provide accurate determinations of exposure. It is a highly complex and time-consuming process, but these researchers understand the obstacles that crews face and know that the test application and interpretation must be watertight.

Soon, Prof. Furlong and his team will start running the samples of crewmembers' blood (presumably) exposed to engine oil to look for and quantify the modified biomarker proteins in a real samples. Ultimately, they hope to develop a procedure that will enable a lab to extrapolate back to define the *time* of exposure to TCPs. They also hope to eventually develop a simpler means for crewmembers to provide a blood sample to a lab, such as a self-serve finger prick kit, and shipping sample on a filter paper. Chain of custody issues will need to be addressed so that the test results are defensible and the identify of the donor can be confirmed. also of great help to affected crews.

Prof. Furlong and his team received some initial funding from our individual members, as well as the Royal Australian Air Force. However, they have been working around the clock for months, effectively for free, because of the volume of associated work and the drive to finalize the blood tests. **We are urgently asking each union to please make another contribution. When completed, this research will produce a practical deliverable that will assist your individual members directly. It will also help us – united – to put a stop to oil fumes in the cabin and flight deck.** We are getting this research at better than cost, but it is not fair to expect these talented and dedicated researchers to work for free. Please donate so that the tests can be a reality. Prof. Furlong's team is continuing to collect blood samples from affected crewmembers, so please let GCAQE know about recently exposed individuals who would like to have their blood stored and tested by his team. Questions about the logistics of wiring a donation? Please contact GCAQE's Judith Murawski (Judith@AFaseattle.org or +206-932-6237) or Tristan Loraine (nic@abel.co.uk or +1403-734-550). **In the past, individual unions have contributed \$10,000 each. The remaining work is budgeted at approximately \$200,000**, but if we all pitch in, we can reach that goal.

*A global coalition of health and safety advocates committed to raising awareness
and finding solutions to poor air quality in aircraft. -- www.gcaqe.org*