Why does it cost so much to make a mouse?

The UMMS TAMC Service Fee for pronuclear injection of fertilized oocytes is based upon the expense of the experimental procedure and therefore is strain-dependent. For example, the expense is greater when performing transgenic or nuclease editing work using fertilized oocytes of C57BL/6 inbred strain of mice than when working with B6/SJL hybrid mice. This is partly due to the purchase cost of each mouse, but is mostly due to the increased fertility of hybrid strains and increased fragility of inbred oocytes.

For example, in a typical C56BL/6 oocyte experiment ($5,850), the TAMC performs 4 injection sessions using 100-125 oocytes injected per session. For a single session, we start with eight super-ovulated female C57BL/6 mice, eight fertile C57BL/6 stud male mice, eight vasectomized male mice, and eight Swiss-Webster recipient female (pseudo-pregnant) mice. This typically results in 3 good transfers, yielding 15-20 live births. In contrast, using C57BL/6 x SJL hybrid mice we can get the same numbers of transfers and live births using about two-thirds the numbers of starting mice, as the hybrid mice super-ovulate much better than inbred mice (more embryos per female), have fewer fragile oocytes (so fewer injections are needed), and have better “take” rates upon embryo implantations. Thus, the cost for hybrid mouse work is less ($4,200).

But why does it cost so much? Because animal costs are expensive. For example, when using C57BL/6 mice:

- Mouse purchase costs ~$22/mouse (x 32 = $700). For 4 sessions = $2,800
- Cage costs -20 cages for 4 sessions (x 8 weeks x UMMS per diem = $640)

Thus, the animal costs for an inbred C57BL/6 experiment are approximately $3,440.

Note that this “animal cost” is 60% of the service fee, but does not include the TAMC costs for many other non-reusable items such as sutures, needles, hormones, media, or analgesics. Nor does it include the technician labor time and expertise needed for plugging, timed mating, embryo harvests, oocyte microinjections, implantation surgeries, post-op care, weaning of mice, and/or animal tail biopsies. These costs are also calculated into the overall fee set by the Office of Research.

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