

January 2023

The Love Consortium NEWSLETTER

We've been working on some exciting projects here at The Love Consortium! We hope your new year is off to a great start as we all look forward to everything 2023 holds for TLC.

Cheers,
Patrick Turner
TLC Communications Specialist



TLC Updates

Here's what The Love Consortium team has been up to since our last newsletter:

- **TLC Staffing:** In September we welcomed Angela Paige as our new Science Communications and Events Coordinator. Joining our team just a couple of weeks before the 2022 TLC Love Conference, Angela dove right into her new role and was instrumental in keeping things running smoothly throughout the events of the week. We look forward to introducing her to more of you at our upcoming events!

- **2022 TLC Love Conference:** On September 28th-30th we were thrilled to host our first in-person event since 2019. The conference was held in Durham, NC and it was wonderful to see so many from our TLC community gathered in one room after such a long time!



- The conference featured posters and flash talks from our Love Fellows, as well as presentations from nearly 30 experts representing numerous regions and fields of study. View the full conference program [here](#).
- All presentations were intriguing and well-received throughout, and we hope the discussions and connections they inspired will continue for years to come.
- We'd like to thank these folks for their time and efforts behind the scenes and as facilitators: Alexis Cameron, Kylie Chandler, Joanne Chung, Shelly Gable, Zoe Hansen, Emily Le, Shira Mond Beker, Stylianos Syropoulos, Mfon and the staff at the Museum of Life and Science, and Candy and the staff at Motorco Music Hall
- TLC also provided travel awards to a select group of underrepresented junior scholars interested in the study of love and social connection. We greatly enjoyed meeting them in person and look forward to staying connected as they make their way to graduate school and beyond!

TLC Updates (continued from page 1)

- **SPSP Travel Awardees:** In partnership with The Relationship Researchers Interest Group (RRIG) the following scholars from underrepresented backgrounds were awarded travel funding to attend the SPSP 2023 Annual Convention. Tell them congrats if you see them!
 - Emefa Amoah
 - Elizabeth Attick
 - Princeton Chee
 - Emily Diamond
 - Tiara Freeman
 - Flora Oswald
 - Gabby Pascuzzi
 - Elizabeth Ray
 - Eri Sasaki
 - Qi Zhang

To submit an announcement, opportunity, or news item to be considered for inclusion in future TLC newsletters or other communications, please complete our [Announcement Submission Form](#).

TLCDv Postathon at SPSP

If you're planning to be in Atlanta for the SPSP Conference February 23rd-25th we invite you to join us for a TLC Dataverse (TLCDv) postathon!

- Friday, February 24th, 12 to 2:30PM at [Max Lager's Wood-Fired Grill and Brewery](#)
- Contribute your dataset description to [The Love Consortium Dataverse](#) while enjoying a free lunch and connecting with other scholars! Spaces are limited, so **SIGN UP TODAY!**

Senior scientists, this is an excellent opportunity to give a gift to a senior student or postdoc: Let them get to know one of your existing datasets by posting a dataset description and being the point of contact for collaboration requests. Being the point of contact on a TLC dataset description is a great resource as they move to their next career stage and a wonderful networking opportunity.



The Love Consortium is currently seeking guest contributors for future newsletters!

If you are interested in writing a deep dive about a topic related to love that interests you or want to learn more about other science writing opportunities with TLC (e.g., our social media ambassadorship), click the button below to get in touch.

BECOME A TLC GUEST CONTRIBUTOR

Deep Dive: What can pair-bonding animals tell us about the neurobiology of love?

Guest contributor: [Karen Bales](#)

As humans we are familiar with the sensation of falling in love – the obsession and the elation – as well as the development of deeper, long-term attachments.

These attachments come with a strong preference for our partner, the development of bidirectional processes by which our partners affect our internal responses and buffer against stress, and grief we feel at separation or loss of our partner. What is more difficult to study in humans is the neurobiology underlying these emotions. Animal models give us more experimental control than do humans. So what can pair-bonding animals tell us about the neurobiology of love?

Oxytocin and Dopamine

Prairie voles (*Microtus ochrogaster*), a pair-bonding rodent from the American Midwest, have become the best-studied model for the neurobiology of love. Prairie vole pairs develop strong preferences for their mate, defend their mates from outsiders, raise offspring together in their cozy burrows, and usually mate for life ([Carter and Getz, 1995](#)). Formation of the prairie vole pair bond, like social behavior in general, has been linked to an ancient hormone made in the brain – oxytocin ([Carter and Kingsbury, 2022](#)). Oxytocin, in addition to its involvement in social behavior, is crucial to labor, parenting and milk letdown in mammals.



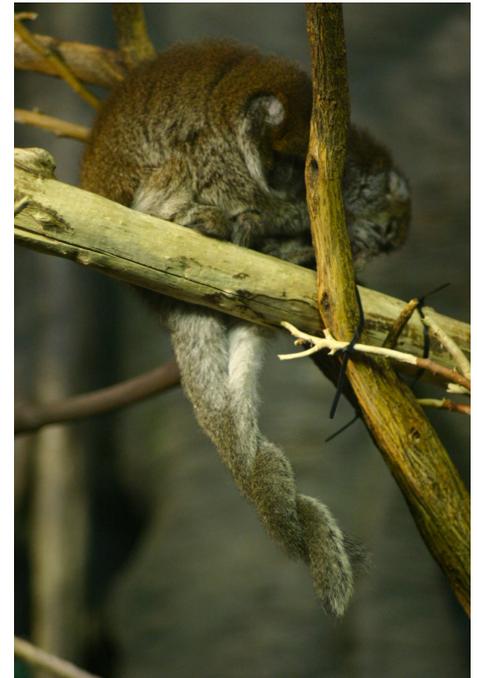
What makes formation of a pair bond different from other types of social behavior? Animal researchers view the development of pair bonds as a form of conditioned response – a process by which the individual comes to associate pleasurable feelings with the pair mate. This conditioned response has been traditionally thought to rely on oxytocin for social recognition, and on dopamine release and action for reward, particularly in an area called the nucleus accumbens ([Inoue et al. 2022](#)). Prairie voles have both oxytocin and dopamine receptors there. Humans have oxytocin receptors in the closely related ventral pallidum ([Loup et al., 1991](#)). Other neurohormones like vasopressin and opioids are also involved in other aspects of pair bonding.

Beyond Oxytocin

One of the most exciting developments in the neurobiology of pair bonding is the recent finding that prairie voles that have been engineered to be missing all oxytocin receptors can still form pair-bonds ([preprint by Berendzen et al.](#)). They could also give birth, displayed nearly normal parental behavior and raised offspring, albeit with less than normal growth. What does it mean to be able to form a pair bond without oxytocin? This is a question that the field will need to answer.

Other Pair-Bonding Animals

Prairie voles are a great model, but they are only distantly related to humans. Titi monkeys (*Plecturocebus cupreus*) are a small monkey from



South America that provides us with a tractable laboratory model for pair-bonding ([Bales et al., 2017](#)). Other pair-bonding animals that are available for laboratory study include owl monkeys, California mice, and a number of species including many birds and fish and even some lizards and insects ([Bales et al., 2021](#)).

Conclusions

Our knowledge of the neurobiology of pair bonding is still incomplete, and mostly concentrated on pair bond formation. Animal models will be critical to our understanding of the neurobiology of other, less studied aspects of pair bonds like pair bond maintenance, as well as frequently associated behaviors like biparental care.

Have a topic you'd like to share with the TLC community?

[Submit an idea here!](#)

Spotlight Researcher: Karen Bales

Karen Bales is a Professor of Psychology, Neurobiology, Physiology, and Behavior at the University of California, Davis, and a Core Scientist at the California National Primate Research Center. She studies the neurobiology of pair bonding and biparental care in prairie voles, titi monkeys, and lined seahorses. In addition, she studies how we manipulate oxytocin in human clinical use, such as the administration of intranasal oxytocin to children with autism.



Could you tell us a little bit about your background and your research generally?

My background actually started in anthropology and I thought that I wanted to study humans- but I soon became fascinated with non-human primates. I ended up interning as an undergraduate at the Audubon Zoo in New Orleans (in both the primate and reptile sections), and then doing a Master's at the University of Tennessee where I got to study parenting in common marmosets. From there, I went to the University of Maryland where I did a Ph.D. in Biology – but spent much of my time in the rainforest of Brazil trailing after golden lion tamarins and picking up their feces in order to measure hormones. Starting with my graduate career, I was always very interested in the differing relationships within families (of animals and people!).

I was getting more and more interested in the neurobiology and physiology of behavior, so I did a post-doc with Dr. Sue Carter who is kind of the OG of prairie voles. All of this has led me to the study of both the neurobiology of pair bonding and parenting, as well as the ways that early experience can affect our ability to form pair bonds or be good parents as adults. I work with different species both because each species has its advantages and disadvantages for this sort of question, but also because studying species that convergently evolved upon a behavior tells us something about the many different paths that have ended up at a similar place.

What originally sparked your interest in conducting research in this field?

Actually, my first interest in animal behavior was stimulated by watching birds. There are fascinating social behaviors in birds, including lots of pair bonding and parenting. Unfortunately, I could never tell bird species apart so I do much better with mammals!

Could you tell us what you set out to investigate with your most recent study?

I have a big lab so we have a lot going on, but one set of studies that we recently finished, but haven't yet published, had to do with the neurobiological basis of titi monkey daughters to their fathers. The fathers do most of the parenting in titi monkeys. We gave oxytocin, vasopressin, oxytocin antagonist and a vehicle control to

the daughters, and then tested various aspects of their relationship with their fathers. This was Lynea Witzak's dissertation work.

What was your most interesting finding? Did anything surprise you?

Lynea found that while fathers buffered their daughters against stress, the higher quality relationship that they had, the larger the buffering effect. Oxytocin antagonist (given to the daughter) blocked the ability of fathers to buffer stress, and the daughters with higher quality relationships had lower cortisol overall. Perhaps not surprising but always gratifying to see a role for oxytocin confirmed.

What might these results be able to tell us about human social relationships?

Human families resemble titi monkey families pretty closely, at least in our primary relationships. The oxytocin is also conserved between titi monkeys and humans. So, it strongly suggests that we look to oxytocin as a mechanism for the stress buffering in close human relationships. This isn't a new idea but it's surprising how little data there are so far on it.

What's next for this line of work? What burning questions do you still have?

For this line of work, we are currently looking at the interactions between the kappa opioid system and oxytocin in the response to separation. One part of an attachment is that you don't like being separated from your attachment figure. We think that this is possibly mediated by effects of the kappa opioid system on the oxytocin system.

What advice would you give to a junior researcher aspiring to pursue a similar line of research?

Get experience with animals! Whether it's a job at the vet, or an internship in a research lab or at a zoo, you will never really know what it's like to work with animals until you give it a shot!

Connect with TLC!

