Can single administration of a high dose GnRH agonist persistently suppress the canid reproductive axis? The coyote (Canis latrans) as a model.

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Deslorelin (Suprelorin®)

Long Term / Permanent Contraception

Gonadotropin Releasing Hormone (GnRH) Analogs

Synthetic decapetide (3,000)

Domestic cats and dogs

Exotic Species

Safe and reversible (?) effective (?) males vs. females (?)

(Junaidi et al., 2001; Trigg et al., 2001; Junadi et al., 2009; Bertschinger et al., 2001, 2002; Millar 2005)

(GnRH) Agonist

PROFERTILITY (Physiological)

Antifertility (Pharmacological)
HPG Axis

Brain (GnRH)

Pituitary (gonadotropins – FSH & LH)

Testes (testosterone)

GnRHR mRNA levels

Transcription LH / FSH

mRNA levels α and β subunit

Translational glycosylation

(Horvath et al., 2004; Dube et al., 1987)

Pituitary and Gonads

GnRH agonist and GnRH immunocontraception

GnRH agonist and GnRH antagonist

(Lunn et al., 1989; Herbert et al., 2004; Snape et al., 2012)

GnRHR in the Gonads

(Bahi et al., 1995; Kakar and Jenners, 1995; Wu H et al., 2009)
Reversibility and Long Term

High Dose Deslorelin in the Rat

Effect of Deslorelin in the dog with hypothetical extrapolation for 47mg dose

A Unique Collaboration: Coyote Model

(Roland et al., 1988)

(Edwards et al., in preparation)

(Junaidi et al., 2009)

(Junaidi et al., [1])

ACC&D 5th International Symposium on Non-Surgical Contraceptive Methods of Pet Population Control
Wildlife Services removes 65,000-100,000 coyotes annually.

Coyote contraception a potential alternative to curb population.

A good .223 curbs the population and is a lot more fun.

The coyotes aren’t breeding the sheep, calves, deer & antelope. They are mutilating and eating and sometimes not even killing them. This really sounds like a good use of tax dollars???????

It’s to bad that Macgregor’s mother didn’t use these contraceptives years ago. It would have solved one problem.

Cabergoline

Single Treatment of a Sustained Release GnRH (deslorelin) Agonist May Chemically Neuter Coyotes

1. Relationship between GnRH agonist dose on duration of suppression
2. Determine cytological pituitary and testicular changes
3. Establish high-dose GnRH agonist effect on pathophysiology

Cabergoline (DeLiberto et al., 2002)
Methods - Male Coyotes

Group 1 (n=3) adults
47 mg deslorelin (9.4 mg)
SQ on April 2011

Group 2 (n=5) pre-pubertal
47 mg deslorelin (4.7 mg)
SQ on January 2012

Relationship Between GnRH Agonist Dose on Duration of Suppression

Sperm Concentration
Testes Volume
Reproductive Hormones

Group 1 (n=3)
Control (n=5)

Time (days relative to implant)

Time (January 2012 – January 2013)
Group 2 (n=5)

Control (n=5)

Sperm (January 2013)

n=2 (control)
Testes Volume: 7.35 ml
Sperm Concentration: 208 x 10^6
Testosterone: 1.431 ng/ml

n=2 (pre-pubertal suppressed)
Testes Volume: Below detection (skin)
Sperm Concentration: 0
Testosterone: 0.023 ng/ml

n=2 (pre-puberty reversed)
Testes Volume: 5.7 ml
Sperm Concentration: 319 x 10^6
Testosterone: 0.069 ng/ml

The Coyote Pituitary – Mechanisms

Ewes 200-800 pg/ml

n=3

n=5

FSHβ
LHβ
Colocalized
Establish High-Dose GnRH Agonist Effect on Pathophysiology

Muscle mass, fat composition and bone mineral density

Metabolic Syndrome in aged men with prostate cancer (adiposity)

M06073 Porky Pig

July

January

Blood Chemistry (17)
Lipid Profiles (HDL/LDL/Trig/Chol)

Future Directions

GnRH Agonists (Suprelorin®) and GnRH Immunocontraception (GonaCon™)
COPITAL BEHAVIOR IN DOGS: VI. LONG-TERM EFFECTS OF CAstration UPON MATING IN THE WOLF

Isotope Analysis – Additional Tools

A Final Note: GnRHR

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(Millar et al., 2004; Millar 2005)

(Hart and Eckstein 1997)
Thank you

Questions?