Poster SAT-235

An Orally Administered Robotic Pill (RP) Reliably and Safely Delivers the Human Parathyroid Hormone Analog hPTH (1-34) (Teriparatide) With High Bioavailability in Healthy Human Volunteers: A Phase 1 Study

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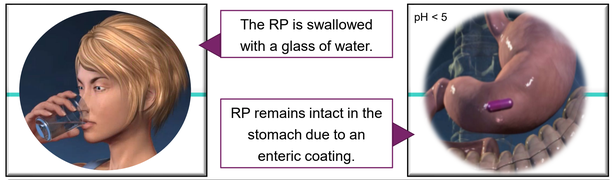
Rani Therapeutics LLC, San Jose, CA & San Antonio, TX. Potential conflict of interest may exist for all authors. Refer to Meeting App

INTRODUCTION AND STUDY OBJECTIVE

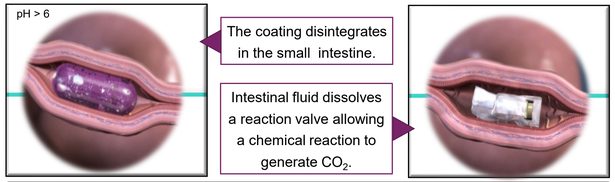
Rani Therapeutics is developing RT-102, a novel, orally ingestible delivery platform robotic pill (RP) containing teriparatide, as an oral anabolic therapy for osteoporosis. As such, this represents a novel route of drug delivery which could potentially affect the kinetics of drug uptake, distribution, and elimination as well as efficacy of the drug. This phase 1 study evaluated the safety , tolerability and pharmacokinetic (PK) profiles of teriparatide delivered via the RP.

HOW THE RP WORKS

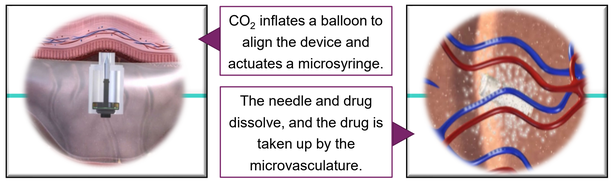
1. Enteric-coated Robotic Pill is Ingested



2. Enteric Coating Disintegrates in Small Intestine



3. Drug is Delivered



STUDY DESIGN

- Study was conducted at a single site in Australia
- End Points: Safety, Tolerability and Pharmacokinetics (PK)
- Healthy women volunteers were dosed in three groups:
  - Forteo® SC: 20µg (N=10)
  - RT-102 Group 1: 20µg (N=15)
  - RT-102 Group 2: 80µg (N=15)
- Radiographic imaging was done to track the transit of RT-102 thru the GI tract and determine T=0 for PK sampling

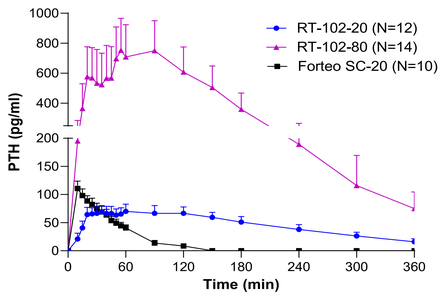
STUDY DEMOGRAPHICS

	RT-102 20µg	RT-102 80µg	Forteo® SC 20µg
N	15	14	10
Age, years	**31.2 (19 - 61)**	**31.2 (20 - 63)**	**32.6 (18 - 63)**
Race			
White-non-hispanic	80% (12/15)	78.6% (11/14)	50% (5/10)
Hispanic	6.7% (1/15)	0% (0/14)	10% (1/10)
Asian	6.7% (1/15)	7.1% (1/14)	20% (2/10)
Asian-Pacific Islander	0% (0/15)	14.2% (2/14)	20% (2/10)
Pacific Islander	6.7% (1/15)	0% (0/14)	0% (0/10)
Body Mass Index (kg/m^2)	23.5 ± 3.9	25 ± 3.6	23.6 ± 3.6
Height (cm)	164.3 ± 7.1	164.4 ± 6.27	162.5 ± 7.7
Weight (kg)	**63.3 ± 10.9**	**67.4 ± 10.2**	**62.4 ± 11.6**

INCIDENCE OF ADVERSE EVENTS

	Adverse Events	RT-102 20µg (N=15)	RT-102 80µg (N=14)	Forteo SC 20µg (N=10)
	All	**0**	**2 (14%)**	**5 (50%)**
Drug-Related AEs	Light headedness	0	0	2 (20%)
	Nausea	0	1 (7%)	3 (30%)
	Vomiting	0	1 (7%)	0
RP-Related AEs	NA	0	0	NA

PHARMACOKINETIC PROFILES AND PARAMETERS



	Forteo SC 20µg	RT-102 20µg	RT-102 80µg
C_{max} (pg/mL)	128 ± 20	98 ± 10	971 ± 223
T_{max} (minutes)	13	68	60
AUC (pg*h/mL)	126 ± 64	342 ± 36	2600 ± 649
Relative BA (%)		~300%	~400%

PK data presented as mean ± SE

DEVICE PERFORMANCE

- Overall rate of successful drug delivery with RT-102 was 90%
  - Evaluated by absence or presence of drug levels in blood samples
- RT-102 remnants were excreted without sequalae

SUMMARY & CONCLUSIONS

- **RT-102 was well-tolerated by all participants**
- **No serious adverse events were observed**
- **No adverse events related to the RP were observed**
- **PK data show robust and reproducible PK profiles of PTH delivered via the RP**
- **Bioavailability of PTH delivered orally via the RP was 3-4-fold higher than SC injection**
- **Success rate of drug delivery by RT-102 was 90%**
- **Device remnants passed out in all subjects without any sequalae**

These data provide evidence of potential of RT-102 to replace current injection therapy for the treatment of osteoporosis.

Visit www.ranitherapeutics.com to learn more or scan the QR code to see a video of the Robotic Pill in action.

Check out RT-102 Preclinical data here at ENDO – Poster SAT-236
See the Robotic Pill with Follicle Stimulating Hormone – Poster FRI-415