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Comparative Biology & Veterinary Biotechnology Sector: Company News Update

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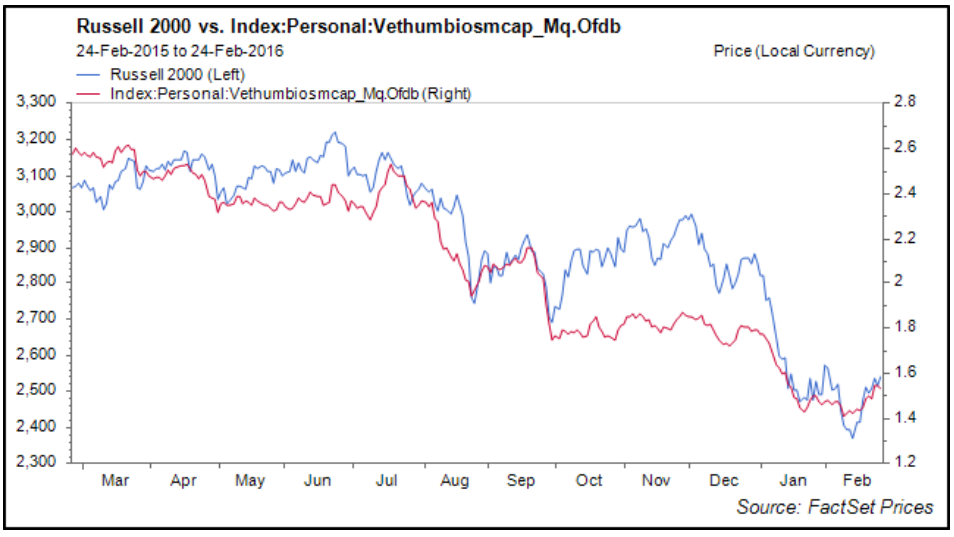
The first few weeks of 2016 have proven to be very productive for companies in our Comparative Biology/Vet Biotech (CBVB) universe. Four companies successfully completed financings in the last two months, which is remarkable considering the state of the markets following a substantial yearend rout in small/micro cap biotechs. Among the "animal" companies, Parnell Animal Health (PARN/$2.77/Not rated) received a 36-month $15 million equity line from Lincoln Park Capital, while Jaguar Animal Health (JAGX/$1.65/Not rated) completed a $5 million public financing through Aegis Capital. ImmuCell Corporation (ICCC/$5.97/Not rated) closed a 1,123,810 share placement at $5.25 to raise $5.9 million and on the "human" side of the house, CytoDyn (CYDY/$0.95/Not rated) competed a private financing that aggregated to an $11.2 million raise. In addition to financing activity, several companies in the sector reported progress in clinical development and commercialization, including Jaguar, Aratana, Inc. (PETX/$3.34/Not rated) and Sorrento Therapeutics (SRNE/$6.01/Not rated).

We are observing an increasing visibility for the veterinary biotech/animal health sector among Dawson's larger peers. This month Credit Suisse initiated research coverage on the group at large and follows sector coverage by BankAmerica/Merrill Lynch, Jefferies, William Blair and Stifel. Two of Dawson's CBVB sector companies, Aratana, Inc. and NextVet Biopharma (NVET/$2.94/Not rated), were among the initial coverage companies. Both received "Outperform" ratings from Credit Suisse. In addition, there are now several animal health specific investor conferences on the docket (Jefferies and BAC/ML, among them) while **BIO**, the industry trade group for biotechnology, has also launched an animal health specific conference scheduled this year in September.



As our index chart to the right indicates, since early February there has been a noticeable uptick in the performance of our index company universe, in line with the Russell 2000, in part, possibly driven by the new research coverage in the group. We believe that a number of

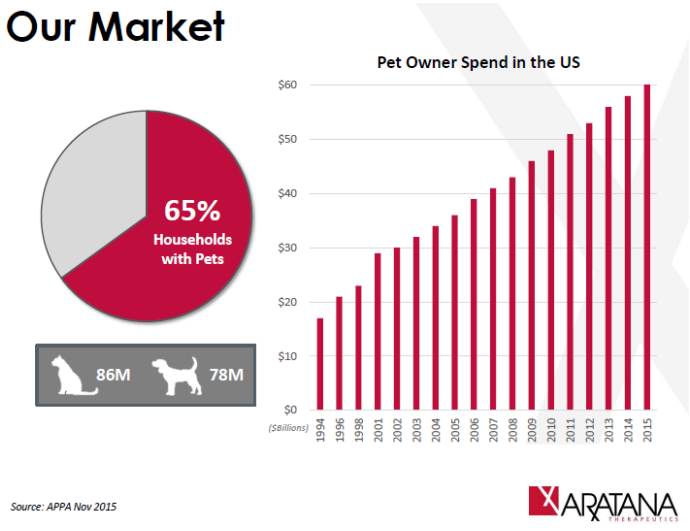
"collateral" factors may also be encouraging investor interest in the sector, such as relative valuations, considering cost-to-market advantages over counterpart human therapeutics companies, an evolving regulatory landscape which may be seen as encouraging innovation in the sector, the migration of new products and services to an emphasis on higher value and sector merger/acquisition activity. On the regulatory front, for example, production animal health companies are no longer permitted to market antibiotics for growth promotion, and food producers are under pressure from the USDA, FDA and Centers for Disease Control and Prevention to track and report their use of the drugs. Last year, California passed the toughest anti-antibiotics law on the books, which not only prohibits the use of the drugs for fattening up animals but also requires that they be prescribed by veterinarians. This change in regulation has spurred a wide variety of new technologies aimed at overall herd health, herd individuals' monitoring and food chain safety. Finally, we believe some investors may be looking at this sector as a "safe haven" from the drug pricing issues and uncertainties currently dogging human therapeutics companies.

"Sentinel" Company, Trupanion Reports Strong Growth in 2015

In our December 2015 Comparative Biology and Veterinary Biotech overview, we pointed out that a "transformation" in the companion animal market, namely the market penetration potential of pet insurance, would be a significant driver to bringing biotech to this marketplace as insurance would allow pet owners to seek innovative (and relatively expensive) treatments for their pets. We highlighted Trupanion, Inc. (TRUP/$9.39/Not rated), an innovator in pet insurance, as a sentinel company for the future growth of our companion animal biotech group. Trupanion is the second largest provider of companion animal insurance in the US.

Trupanion, headquarted in Seattle, was founded in 2000 in Vancouver, British Columbia, and began selling pet insurance in the US in 2008. Since then, the Company has grown to nearly $150 million in revenue and now has nearly 300,000 enrolled pets. Trupanion has accumulated 5.5 million pet health records over the last 14 years from its members. There are approximately 160 million companion dogs and cats in the US alone, representing a $60 billion market for veterinary care and companion animal products.

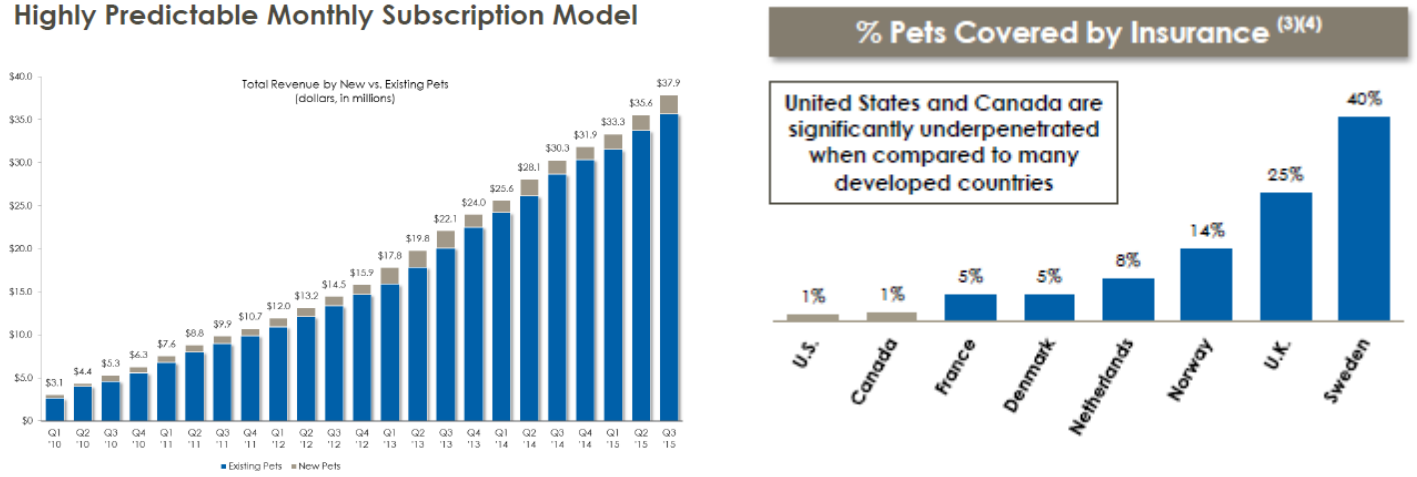
Recent Companion Animal Market Data



Earlier this month, the Trupanion reported yearend results that demonstrated the nascient penetration of pet insurance and suggests a very large untapped market opportunity. A few highlights from the Company: Overall revenue rose to $147 million in 2015, up 27% (up 31% in constant currency, Canadian dollars). Subscription business revenue rose 29% (33% in constant currency), while total pet enrollments rose 26% year-over-year. Similarly, subscription enrolled pets also rose 27% year-over-year to 272,636. The fourth quarter of 2015 was TRUP's 33rd consecutive revenue growth quarter. The average coverage life per pet is now a little over 6 years, which speaks to the very high recurring customer revenue depicted in the **Subscription Model** graph below.

Furthermore, as the **% Pets Covered** chart indicates, North America is substantially under-penetrated compared to practice in Europe. We believe that vets themselves will drive the penetration of insurance as models such as

Trupanion Express™ a cloud-based application that allows TRUP to receive, process, approve and disburse payments for eligible claims within minutes, incentivizes veterinary practice participation. In its first year of operation, Trupanion Express was installed in 500 vet hospitals and paid $23 million directly to vets for claims and services rendered to enrolled pets. Trupanion's highest paid claim for a dog was $42,208 and the highest paid claim for a cat was $38,581 in 2015.



Source: Trupanion December 2015 investor presentation

Other News from Sector Companies

Aratana announced on February 17th that it had filed a Marketing Authorization Application with the European Medicines Agency (EMA) for **Galliprant®,** which is intended to treat pain and inflammation in dogs with osteoarthritis. The EMA has started reviewing the submission and Aratana anticipates marketing authorization in 2017. The New Animal Drug Application (NADA) for Galliprant has already been submitted to the FDA's Center for Veterinary Medicine (CVM) for the same indication. The Animal Drug User Fee Act (ADUFA) date for Galliprant is set for March 25, 2016. Aratana anticipates commercial availability of Galliprant to US veterinarians in fall 2016. Galliprant is a new chemical entity and first-in-class piprant product that is highly targeted and works by binding to the EP4 prostaglandin receptor antagonist (PRA) on the PGE2 pathway to block pain and inflammation without adverse effects on the kidney and platelet function seen with NSAIDs.

On February 22nd, Aratana received a technical section complete letter for effectiveness from the CVM for AT-003, brandname NOCITA® (bupivacaine liposome injectable suspension), which is indicated to provide local post-operative analgesia for cranial cruciate ligament surgery in dogs. NOCITA is a long-acting local anesthetic designed to provide up to 72 hours of post-operative pain control. The NOCITA application was supported by data from a multi-center, placebo-controlled, randomized and masked field study of 182 client-owned dogs undergoing cranial cruciate ligament stabilization surgery. Results from the study showed NOCITA met efficacy success criteria of no rescue analgesia required as assessed by trained observers using the Glasgow Composite Measure Pain Scale-Short Form. The primary endpoint for effectiveness was evaluated in the first 24 hours and showed NOCITA provided statistically significant (p=0.0322) success rates (68.8 percent) compared to placebo (36.5 percent). The Animal Drug User Fee Act (ADUFA) date for NOCITA is June 7, 2016.

The technical section complete letter for effectiveness is the second of the three major technical section complete letters required for an administrative New Animal Drug Application (NADA) approval. The Company

is awaiting a response from CVM on the chemistry, manufacturing and controls (CMC) technical section. If the Company receives a technical section complete letter for the CMC section, Aratana plans to finalize the product label, complete the other minor sections and submit the administrative NADA in the summer of 2016. If NOCITA receives FDA approval, Aratana expects to commence commercial launch in late 2016. This follows similar progress for the Company's ENTYCE® (capromorelin oral solution) product, for appetite stimulation in dogs.

Jaguar Animal Health completed a 2,000,000 share placement at $2.50 earlier this month. The additional funding will underpin the upcoming commercial launch of the Company's first prescription product, Canalevia™, for chemotherapy-induced diarrhea in dogs. Jaguar notes that 230,000 dogs receive chemotherapy annually. Jaguar is developing species-specific forms of Canalevia™, the pharmaceutical preparation of crofelemer, as first-in-class plant-based gastrointestinal products for horses, dogs and young calves. A human-specific formulation of crofelemer, **Fulyzaq**, was approved by the FDA in 2012 for the symptomatic relief of noninfectious diarrhea in adults with HIV/AIDS on antiretroviral therapy. The compound acts by modulating the flow of ions through the calcium and chloride ion channels and water in the lumen of the intestine.

Concurrently with the financing, Jaguar announced topline results of its proof-of-concept trial of SB-300, a pharmaceutical formulation of crofelemer for equine gastric ulcer syndrome (EGUS), demonstrating a statistically significant dose-dependent effect in the improvement of equine glandular ulcerations compared to placebo. In the high dose cohort, 89% of horses improved in as soon as 14 days, compared to only 25% of placebo-treated horses. By day 35, all of the treated horses had experienced improvement or complete resolution compared to only 33% of those in the placebo group. Importantly, SB-300 preserved the normal, physiological low pH of the gut, essential for normal digestion and gut immunity. This is a significant differentiator compared to the proton-pump inhibitor standard of care, omeprazole, which negatively impacts GI pH. Independent studies have revealed a very high incidence of ulcers (90+%) among performance horses and treatment costs range from $35-50/day. Ulcers can greatly impact equine performance and many "standard" treatments cannot be used during performance due to substance bans.

Sorrento Therapeutics, Inc. (SRNE/$5.94/Not rated) recently announced the formation of an exclusive research partnership with the Karolinska Institutet in Sweden for the discovery and development of adaptive NK (natural killer) cell therapies for immuno-oncology. Researchers at the Karolinska were the discoverers of NK cells and the partnership provides Sorrento with a unique discovery engine compared to its competitors. In other news from Sorrento, the Company announced the completion of confirmatory Phase III trials in China for two of its biosimilar antibody products, STI-001 and STI-002, biosimilars for Cetuximab (Erbitux®) and Infliximab (Remicade®), respectively, by its Chinese partner, MabTech Ltd. Both Phase III trials met trial endpoints and demonstrated an improved side effect profile compared to the branded drugs. Sorrento's biosimilars subsidiary, Sorrento Biologics, Inc.'s developed the underlying antibody manufacturing expertise that produces a novel chimeric monoclonal antibody from (hamster) CHO cell lines for ST-001. The modification of production cell line has resulted in fewer instances of Grade 3 and 4 Adverse Events compared to that reported with the use of Erbitux, which is reliant upon a murine (mouse) cell line.

Sorrento focuses on the novel use of therapeutic antibodies and intracellular immune-targeting technologies for the treatment of cancer, autoimmune disorders and pain, among other indications. Sorrento's wholly-owned animal therapeutics company subsidiary, Ark Animal Health Inc., has developed Sorrento's non-opiate pain technology for intractable pain in companion animals (dogs, cats and horses). Ark's lead product, ARK-001 (resiniferatoxin or RTX), received MUMS designation from the FDA on June 19, 2015 and the application for a CNADA (Conditional New Animal Drug Application) is in preparation. Once the CNADA is approved, Ark

will be permitted to sell RTX while completing data collection for full approval, a process similar to human Phase IV post-marketing studies. Data from a clinical study conducted at the University of Pennsylvania enrolling 53 dogs with osteoscarcoma and other bone cancers, supported the MUMS designation. Ark is developing additional veterinary applications of Sorrento technology beyond the intractable pain indication.

In Private Company News:

Blaze Biosciences announced on February 25th, the publication of a peer-reviewed paper, "*Fluorescence Identification of Head and Neck Squamous Cell Carcinoma and High-Risk Oral Dysplasia With BLZ-100, a Chlorotoxin-Indocyanine Green Conjugate*" in the March 2016 issue of **JAMA Otolaryngology Head & Neck Surgery** and online at http://archotol.jamanetwork.com. The paper was co-authored by the teams at the University of Washington, Fred Hutchinson Cancer Research Center, and Blaze Bioscience and discusses results of the use of Tumor Paint BLZ-100 in models of head and neck squamous cell carcinoma (HNSCC) and dysplasia. BLZ-100 demonstrated highly sensitive and specific uptake in HNSCC tumor xenografts. Additionally, BLZ-100 uptake increased with the severity of dysplasia and distinguished between high- and low-risk dysplasia indicating that clinically, BLZ-100 may be useful in sparing unnecessary biopsies or, alternatively, prompting necessary surgery. Earlier this month, Blaze presented a poster on BLZ-100 at the SPIE Photonics West Conference.

BLZ-100 Tumor Paint consists of an optimized peptide conjugated with a fluorescent dye which emits light in the near-infrared range. The Tumor Paint specifically targets cancer cells and allows the surgeon to have real-time, high resolution visualization of cancer cells continuously during surgery. The product received funding from the NIH for companion animal studies for glioma and is in multiple Phase I human trials brain, breast, lung and other solid tumor cancers. *SG*

Ticker	Security Name	Last Price*	%Chg	30 Day Vol Avg	YTD %Chg	12 Mo %Chg	Mkt Cap ($MM's)	EPS FY1	PE FY1
ABSCF	AB Science SA	14.56	0.00%	0	10.14%	-21.64%	387	-0.76	--
ALQA	Alliqua BioMedical, Inc.	1.04	-0.95%	82,315	-51.40%	-82.55%	29	-0.67	--
ANIK	Anika Therapeutics, Inc.	43.37	8.02%	162,627	13.65%	-4.07%	652	1.74	24.96
PETX	Aratana Therapeutics, Inc.	3.34	-1.18%	670,535	-40.14%	-82.20%	117	-2.01	--
CTIX	Cellceutix Corporation	1.18	-0.08%	215,944	-11.35%	-67.07%	141	--	--
CYDY	CytoDyn Inc.	0.95	6.15%	305,503	23.38%	20.25%	112	--	--
DPH-LON	Dechra Pharmaceuticals PLC	11.85	-1.25%	172,894	8.42%	28.04%	1,044	0.43	27.59
GNVC	GenVec, Inc.	0.51	1.98%	126,159	-72.28%	-84.16%	9	-0.37	--
ICCC	ImmuCell Corporation	5.97	1.96%	18,120	-20.35%	-14.71%	25	--	--
JAGX	Jaguar Animal Health, Inc.	1.65	-1.79%	54,471	-26.67%	--	17	-3.27	--
KPTI	Karyopharm Therapeutics, Inc.	5.8	-1.86%	330,144	-56.23%	-79.26%	207	-3.21	--
KIN	Kindred Biosciences, Inc.	3.89	-1.27%	48,899	14.41%	-43.13%	77	-1.49	--
NVC-TSE	Neovasc Inc.	4.41	-0.68%	1,931	-29.44%	-64.00%	294	-0.54	--
NVET	Nexvet Biopharma PLC	3.26	6.89%	31,884	-4.40%	-67.10%	38	-1.83	--
OASM-OME	Oasmia Pharmaceutical AB	9.8	0.00%	64,870	-7.98%	-55.25%	1,034	--	--
ONCS	OncoSec Medical Incorporated	1.77	0.00%	92,527	-25.32%	-77.16%	30	-1.83	--
PARN	Parnell Pharmaceuticals Holdings Ltd.	2.77	1.84%	47,746	-28.61%	-37.02%	37	-1.7	--
PETV	PetVivo Holdings Inc	2.16	0.00%	165	-10.93%	-46.73%	17	--	--
RGS-ASX	Regeneus Ltd.	0.08	-3.66%	68,444	-15.96%	-50.62%	17	-0.02	--
SAC-ETR	SANOCHEMIA Pharmazeutika AG	1.41	0.00%	6,702	3.45%	19.49%	18	0.07	20.14
SCYX	SCYNEXIS, Inc.	4.73	1.50%	16,197	-23.83%	-52.70%	66	-2.65	--
SVA-TSX	Sernova Corp.	0.25	2.08%	141,747	-15.52%	32.43%	34	--	--
SRNE	Sorrento Therapeutics, Inc.	6.01	-4.45%	403,237	-31.00%	-54.40%	227	-1.56	--
TRUP	Trupanion, Inc.	9.07	1.91%	108,255	-7.07%	16.43%	258	-0.32	--
VETO-PAR	Vetoquinol SA	34.07	0.00%	1,633	-13.53%	-12.30%	405	2.25	15.14

Source: FactSet
*Prices as of 2/25/16

Private	Blaze Biosciences	Novel imaging agent used to define tumor margins during surgery; canine studies supported NIH grant
Private	Susavion	Novel peptided immunotherapies based C-type and I-type lectins. Just initiated canine trial for lead compound
Private	Juvaris BioTherapeutics	Novel cancer vaccines based on cationic lipid/DNA complexes. Canine allogenic tumor vaccine trial started
Private	MetaMorphix Inc.	Canine genetic testing
Private	Protein Sciences	Novel vaccines, FluBlok (trivalent flu vaccine) is genetically produced vaccine using canine kidney cells
Private	GeneQuine	Novel gene therapy directed against Il-1r for equine and human osteoarthritis
Private	Vet-DC	Novel acyclic nucleotide analogue, Tanovea, awaiting conditional approval for canine lymphoma
Private	Vet-Stem Biopharma	Allogenic adipose-derived stem cells for a number of indications

Risk Factors

In addition to normal economic and market risk factors that impact most equities, and the common risks shared by the companies named in this sector and those in the biotechnology sector as a whole, we believe an investment in any of the Dawson James Comparative Biology Sector companies involves the following risks:

- **Regulatory risks** – the companies in the DJ Comparative Biology Sector are subject to regulatory review for their ongoing research and development activities and manufacturing operations with local, state and federal governmental agencies both in the US and Internationally.

- **Need to defend patents, trade secrets and other intellectual property** – Biotechnology companies rely heavily on intellectual property related to their technology and products. While larger companies may have adequate resources to defend their intellectual property, most of the smaller companies in the DJ Comparative Biology Sector would be materially and negatively impacted by intellectual property infringement or the loss of one or more patents.

- **Historical lack of profitability** – To date this year and in past years, most of the companies in the DJ Comparative Biology Sector have not operated on a profitable basis, and are not forecast to do so in the immediate future. Although companies typically have been able to raise funds from the capital markets, there can be no guarantee that any particular company will not be able raise additional operating capital in the future should losses continue.

- **Competitive Markets** – This universe of companies operate in a highly competitive marketplace, where speed to market, clinical results and other factors bear on a company's viability. There can be no assurance that any one company will be able to continue to market or later launch its products successfully in these competitive markets in the future.

- **Limited stock liquidity** – Trading volume in some of the companies in the DJ Comparative Biology Sector has been comparatively light compared to other stocks in their sector, and as such, news regarding these companies, their target market, partners and/or competitors could lead to significant volatility in their stock price.

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2) **Neutra**l: the analyst believes the price of the stock is fairly valued for the next 12-18 months;
3) **Sel**l: the analyst believes the price of the stock will decline by at least 20% over the next 12-18 months and should be sold.

The following chart reflects the range of current research report ratings for all companies followed by the analysts of the Firm. The chart also reflects the research report ratings relating to those companies for which the Firm has performed investment banking services.

	Company Coverage		Investment Banking	
Ratings Distribution	# of Companies	% of Total	# of Companies	% of Totals
Market Outperform (Buy)	16	67%	10	63%
Market Perform (Neutral)	8	33%	6	75%
Market Underperform (Sell)	0	0%	0	0%
Total	24	100%	16	67%

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