



Eugene Consulting Inc.
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October/November 2021 Report



Ring Therapeutics

- Ring Therapeutics is a biotechnology company revolutionizing the gene therapy and nucleic acid medicine space by pioneering the development of a new class of viral vector
- They developed the Analogy platform, which harnesses the commensal virome of anelloviruses (a community of viruses found naturally within humans), which over million of years of evolution have derived highly favourable properties such as potentially enhanced tropism and immune tolerance
- Partnered with Flagship Pioneering, the company aims to develop and further expand its portfolio by leveraging its platform to successfully dose therapeutic cargos in a potentially safer and more targeted manner to unreachable organs and tissues elusive to current therapies

Nautilus and Abcam Announce Strategic Partnership to Accelerate Exploration of the Proteome - November 2, 2021

- Nautilus Biotechnology Inc. announced a strategic development and supply partnership with Abcam, a global innovator in life sciences research tools
- The partnership leverages Abcam's industry-leading recombinant monoclonal antibody development technologies and expertise to enhance Nautilus' reagent research and development
- The companies have also established a long-term supply relationship
- The partnership will initially focus on the collaborative development of affinity binding reagents for use on the Nautilus proteomic analysis system
- In the near future, they plan to expand in the near future to the large-scale manufacture and supply of reagents for commercialization
- Under the terms of the agreement, Abcam will provide Nautilus with antibodies that are expected to add to and enhance its own library of affinity binding reagents
- At the end of 2021, Nautilus also signed their second and third research collaborations - both will utilize the Nautilus platform across a number of projects to investigate proteins and proteoforms of interest
 - A global pharmaceutical company
 - An investigator at the University of Texas MD Anderson Cancer Center
- The company also shared a manuscript that introduces the theoretical foundation for a fundamentally different approach to proteomics, called Protein Identification by Short-epitope Mapping (PrISM)



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Nautilus Biotechnology third quarter 2021 financial results:

- Operating expenses: \$14.6 million
 - 262% increase from 4 million for the 3 months ended September 30, 2020
- Net loss: \$14.5 million compared to 4 million for the corresponding prior year period
- Cash, cash equivalents, and investments were \$374 million as of September 30, 2021

Amazon has made a deal with Hilton for their healthcare platform Amazon Care

- Amazon has announced a newly inked deal with Hilton
- The deal entails Hilton employees being able to access Amazon's healthcare platform for on-demand medical services
- Hilton's interest in Amazon Care is a testament to evolving industry interests and Amazon's commitment to disrupting the healthcare system,

Amazon fitness tracker - Halo View

- Halo View is the newest addition to the Halo collection
 - It retails for \$79.99, plus an additional \$3.99 monthly fee for the Halo membership after the first year
 - It comes in three colours: sage green, lavender dream and active black
 - It's available in sizes small/medium or medium/large
 - There are also 15 additional sports bands available for purchase starting at \$14.99 and 8 fabric bands for \$29.99 each
 - It is water-resistant and swim-proof up to 50m
 - 7 day batter life that fully charges in 90 minutes
- Halo View features:
 - Counts steps
 - Accounts for key health metrics like heart rate and blood oxygen levels
 - It sends texts and reminder notifications
 - Includes a tone analysis option, which allows for users to analyze how their tone of voice may be perceived by others
- Halo smartphone app
 - Through the Halo smartphone app, users have access to tracking sleep temperature, time awake and asleep, calories burned, heart rate, steps, activity sessions, and limited workouts, recipes, and individualized programming
 - An additional active membership (\$3.99 a month), allows users to access a slew of additional perks including tools to manage sleep, enhance exercise, measure body composition, and more
 - The app will also soon be upgraded to include Halo Fitness and Halo Nutrition
 - The fitness portion will offer hundreds of exclusive workouts - including access to workouts from Orangetheory, SWEAT, Aaptiv, and more
 - Users will also have the opportunity to take a "movement assessment" through the app to create a personalized exercise program and will also be



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- able to use their smartphone camera and Halo app to measure body fat percentage
- The Halo's Body feature is nearly twice as accurate as leading at-home smart scales and a personalized 3D model helps you track changes
- Halo also uses the smartphone camera to accurately measure your mobility, stability, and posture and then provides a personalized plan to help you improve over time
- The nutrition portion of the app will include personalized meal planning tools and recipes from WW, Lifesum, and Whole Foods Market
 - Members can easily add ingredients for recipes and additional groceries directly to their Alexa shopping list
 - Halo nutrition is planned to launch in January 2022

Amazon's Alexa is finding a voice in healthcare settings

- Amazon is launching a new service for hospitals that will embed its voice technology deeper into clinical settings at scale
- As part of Alexa Smart Properties, the service will simplify how hospitals and senior living facilities deploy and manage Alexa-enabled devices across their properties
- Ways in which Alexa can be used in hospitals:
 - Alexa devices in hospital rooms can help patients keep in touch with their families, connect with care team members, easily access news and information, and play music
 - Patients can also ask Alexa for things they need - ex. "Alexa, tell my nurse I need pillow"
 - The use of AI to interpret patient intent enables the message to be sent to the appropriate care team member using existing hospital communication systems
- Senior living communities such as Atria and Eskaton and hospitals including Boston Children's, Cedars-Sinai, BayCare and Houston Methodist have signed on to add Alexa to some of their facilities
- While hospitals are keen to integrate voice technology into the patient experience, a challenge has been to manage the device at scale
- In 2019, Clearwater, a Florida-based BayCare Health System piloted the technology at two hospitals
 - They deployed Amazon Alexa devices in 2,500 rooms across its 14 hospitals
 - The aim was to provide patients with smart rooms that allow them to connect with their care team and control devices like the television, hand-free
- In 2019, Cedars-Sinai also piloted Amazon Alexa devices in more than 100 patient rooms to enable patients to interact hands-free with nurses and control their entertainment
- Early during the COVID-19 pandemic, hospitals and senior living communities reached out to Amazon to enable Alexa voice solutions, as supplies of PPE were limited



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- Based on feedback from the early pilots, Amazon added features to support senior living facilities and hospitals, such as the ability for video capabilities and Drop In - features that enable providers to communicate with patients without the need to enter their rooms
- Hospitals can also provide information customized to their facility, such as notifications about schedule changes or cafeteria menus
- By working with solution providers like K4Connect, Lifeline Senior Living, Aiva and Vocera, senior living and healthcare properties can use Alexa Smart Properties to customize large numbers of Alexa-enabled devices and make it easy for solution providers to manage and service the devices quickly, remotely and at scale
- The company has stated that no personal information is shared with Alexa to use the device and that voice recordings are not saved
- They have also implemented administrative, technical and physical safeguards for protected health information review as part of HIPAA-eligible skill interactions

- In July of 2021, Amazon' cloud division rolled out AWS for Health - a set of services and partner solutions for healthcare, genomics and biopharma
- AWS for Health is intended to help organizations increase the pace of innovation, unlock the potential of health data, and develop more personalized approaches to therapeutic development and care
- There services within AWS for Health can help healthcare customers create holistic electronic health records to help clinicians make data-driven care plans and power population genomic initiatives to expand precision medicine accessibility
- Microsoft, Google and AWS are pushing deeper into healthcare in a battle to provide cloud computing and data storage technology to hospitals
- As part of AWS for Health, Amazon announced the general availability of Amazon HealthLake - a tool to make it easier for healthcare organizations to search and analyze data
 - Amazon HealthcareLake is a HIPAA-eligible service for healthcare and life sciences organizations that aggregates an organization's complete data across various silos and disparate formats into a centralized AWS data lake and automatically normalizes this information using machine learning
 - The service identifies each piece of clinical information, tags indexes events in a timeline view with standardized labels so it can be easily searched
 - It also structures all of the data into the Fast Healthcare Interoperability Resources (FHIR) industry-standard format for a complete view of the health of individual patients and entire populations
 - HealthLake's natural processing also allows for the extraction of information such as medication, diagnosis, and previous conditions from doctors' clinical notes to examine barriers to healthcare access
- Alongside AWS for Health, Amazon HealthLake has the potential to help medical providers, health insurers, and pharmaceutical companies provide patients and populations with data-driven, personalized, and predictive care



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- Other organizations using Amazon HealthLake include Cortica, InterSystems and Redox

Amazon Alexa used in Healthcare in Canada

- A pioneer in geriatric care in Toronto, Onatrio, Baycrest is an academic health sciences centre that provides continuum of care for over 1,200 older adults
- In response to COVID-10, Baycrest restricted visitors to campus and limited the external and internal mobility of residents to combat the virus
 - This isolation proved challenging for patients' mental health
 - To support patients, Baycrest launched their Telemedicine Rapid Implementation team
 - This team stationed Amazon Echo dots in public spaces and on traveling telemedicine carts for residents to listen to music, do charades, or practice a skill
- Baycrest also plans to implement smart suites which are comprised of smart lighting, blinds, and thermostats connect to Amazon Show
- The simplicity of using voice-based technology has made this technology easily accessible to Baycrest residents
- During the pandemic when much human resources were being used to screen for symptoms of COVID-19, McGill University Health Center launched a pilot program they launched a screening for COVID-19 at the cardiology clinic
 - This worked effectively for 215 patients, demonstrating that voice-based technologies can be used to efficiently screen patients and their families for symptoms of COVID-19
 - Alexa asked patients screening questions in both French and English
 - Patients and families reported that they felt comfortable using the system and that it was easy to use - especially for the older patient population
 - The team is now developing a COVID=19 vaccine chat bot to help answer commonly asked questions around the COVID-10 vaccines
 - By automating part of the intake process, they demonstrated that such technologies could reduce the burden on their healthcare teams
- University Health Network (UHN) is the largest teaching hospital in Canada and the team has launched a digital health intervention called Medly to help patients and families self-manage care for heart failure
 - Patients use a smartphone app to measure blood pressure, weight, and their symptoms daily
 - The app's algorithm advises the patient on medication use and self-care best practices, ultimately notifying the clinic if required
 - Through this initiative, UGN successfully reduced the amount of hospitalizations by more than 50% and worked to improve health outcomes
 - Despite the program's success, accessibility to smartphone devices can be a challenge for certain populations and the team believes that voice command tools such as the Alexa platform can be a good complement or alternative to using smartphone apps



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- As a result, the team launched an Alexa version of the Medly application, creating a visual aspect for the Echo Show to drive engagement
- Through a clinical pilot with 20 patients, UHN discovered that for certain patients, voice-based technology was much more user friendly and drove higher participation than the app-based system
- Alexa is also more cost effective than a smartphone
- The UHN team is working towards implementing this solution into clinical use after acquiring the necessary quality and security checks - supported by AWS

Microsoft's \$19.7 billion acquisition of speech recognition and healthcare AI company Nuance

- In April 2021, Microsoft bought AI speech tech firm **Nuance** for \$19.7 billion
- Microsoft will pay \$56 per share for Nuance - a 23% premium over the company's closing price
- Nuance is best known for its Dragon software, which uses deep learning to transcribe speech and improves its accuracy over time by adapting to a user's voice
 - Dragon is an industry leader in terms of transcription accuracy
- Nuance's licensed tech is used for Apple's digital assistant Siri
- This is Microsoft's second-largest purchased behind LinkedIn
- In 2019, Microsoft and Nuance announced a strategic partnership to use Nuance's software to digitize health records for Microsoft clients
- Nuance's health tech, including its Dragon Medical One platform, which is tuned to identify medical terminology, is reportedly used by more than half a million physicians worldwide and in 77% of US hospitals
- Nuance's solutions with help to augment the Microsoft Cloud for Healthcare and help Microsoft empower healthcare providers through the power of ambient clinical intelligence and other Microsoft cloud services
- Over the years, Nuances' technology has evolved to include the ability to learn medical terminology, languages and accents
- In recent years, Nuance applied AI to its software for new use cases, including ambient clinical documentation
 - In this case, a smart speaker in an exam room picks up on key words during a patient visit and can translate the relevant speech into actions or activities within the EHR
 - Ex. A physician using voice command to order medications or add a diagnosis to the chart
- Microsoft's acquisition of Nuance is certain to accelerate the use of AI and natural language processing within clinical workflows