



# **Bella Tella: Personalized Beauty Product Recommender**

**Nan Shen  
Insight 02072019**

# Apple Inc.



~ \$90 billion

# Cosmetic Industry



**\$523 billion**

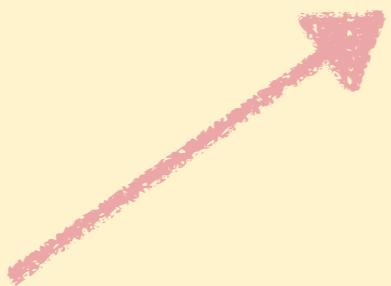
# Gold Mining



# Gold Mining



Increase Sales



Shopping  
Experience

# ~300 Brands



CAUDALÍE  
PARIS



benefit *fresh.*  
SAN FRANCISCO

SK-II



HOLLYWOOD, CALIFORNIA

GLAMGLOW®

tarte

high-performance naturals™

L'ORÉAL  
PARIS

Shopping  
Experience



Elizabeth Arden

NEW YORK

SHISEIDO



ESTĒE  
LAUDER  
COMPANIES

Kiehl's  
SINCE 1851

C  
CLINIQUE

CLARINS  
PARIS

LANEIGE

~1,000,000 Reviews

The figure is a word cloud centered around skincare products and their effects on different skin types. The words are arranged in a roughly circular pattern, with larger, bolder words representing more frequent or prominent terms. The background is white, and the text is in a black sans-serif font.

**Sensitive Skin:** absorb quickly, write review, definitely recommend, skin looked, combination skin, used every day, used product, skin looking, make skin, noticed skin, oily skin, love stuff, holy grail, every night, skin glow, product use, oily acne, acne prone, continue use, really work, love first time, skin never, even though, large pore, price tag, one use, skin tone, received product, product complimentary, hormonal acne, acne scar, vitamin serum, skin felt, tried everything, hyper pigmentation, started using, works well, cystic acne, dry patches, dark spot, spotty treatment, skin type, product really works, within day, product used, face neck, skin smooth, great product, received sample, see difference, using serum, weeks now.

**Oily Skin:** makes skin, fine line, skin look, skin care little goes, testing purpose, make sure, try product, skin soft, love product, highly recommend, skin feel, every day, twice day, around eye, dry Gene, long way, Sunday Riley, Good Genes, skin oily, acne scarring, use morning, see result, complimentary testing, got sample, product skin, use product, weeks now.

**Acne Prone Skin:** will continue using week, Drunk Elephant, couple weeks, love serum, go away, face look, worth every, anti aging, leaves skin, skin feeling, day night, months now.

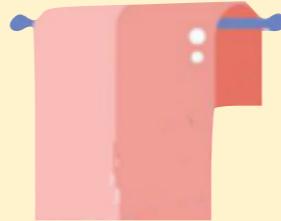
**Dry Skin:** stops using, absolutely love, free sample, next day, noticed difference, will last, using month, skin dry, little bit huge difference, skin much, every day, twice day, around eye, long Riley, Good Genes, skin oily, acne scarring, use morning, see result, complimentary testing, got sample, product skin, use product, weeks now.

# Shopping Experience

# Personal Needs



Shopping  
Experience



# Review Mining



# For Industry

Insights of customer preferences

Product  
Features

Increase Sales

Shopping  
Experience

Personalized purchase suggestions

# Behind the makeup

For Customers

For Industry

Sephora Reviews



SEPHORA STANDS

Word  
embeddings  
model

Review  
sentiment

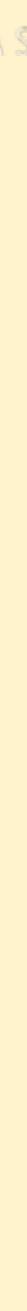
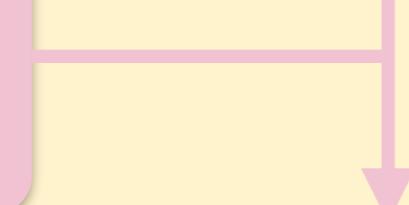
Topic  
modeling

Customer's  
skin  
concern

Keywords

Personalized  
product  
suggestions

Customer  
Segmentation



# Semantic search

Sephora Reviews



SEPHORA STANDS

Word  
embeddings  
model

Customer's  
skin  
concern

Keywords

# Word embedding models

Sephora Reviews



Word2Vec

SEPHORA STANDS

GloVe

FastText

Word  
embeddings  
model

Customer's  
skin  
concern

Keywords

# Word embedding models

Sephora Reviews



Word2Vec

SEPHORA STANDS

GloVe

FastText

Word  
embeddings  
model

Customer's  
skin  
concern

Keywords

Contextual  
&  
Semantic

General  
&  
Semantic

Edit  
distance

# Semantic search

Sephora Reviews



Word2Vec  
SEPHORA STANDS

Word  
embeddings  
model

Wrinkle

Keywords

ageing  
polyphenol  
crease  
aging  
elevens  
broad  
oxidants  
neuropeptide  
spectrum  
ager

# Contextual sentiment

Sephora Reviews



SEPHORA STANDS

Contextual  
sentiment

*Example:*

This product has neuropeptides. Happy to  
see my wrinkles gone!

# Contextual sentiment

Sephora Reviews



SEPHORA STANDS

Contextual  
sentiment

*Example:*

This product has neuropeptides. Happy to  
see my wrinkles gone!



This product has neuropeptides.

Happy to see my wrinkles gone!

# Contextual sentiment

Sephora Reviews



SEPHORA STANDS

Contextual  
sentiment

This product has neuropeptides. 0

Happy to see my wrinkles gone! 0.9

# Semantic search

Sephora Reviews



SEPHORA STANDS

Word2Vec

Contextual  
sentiment

Wrinkle

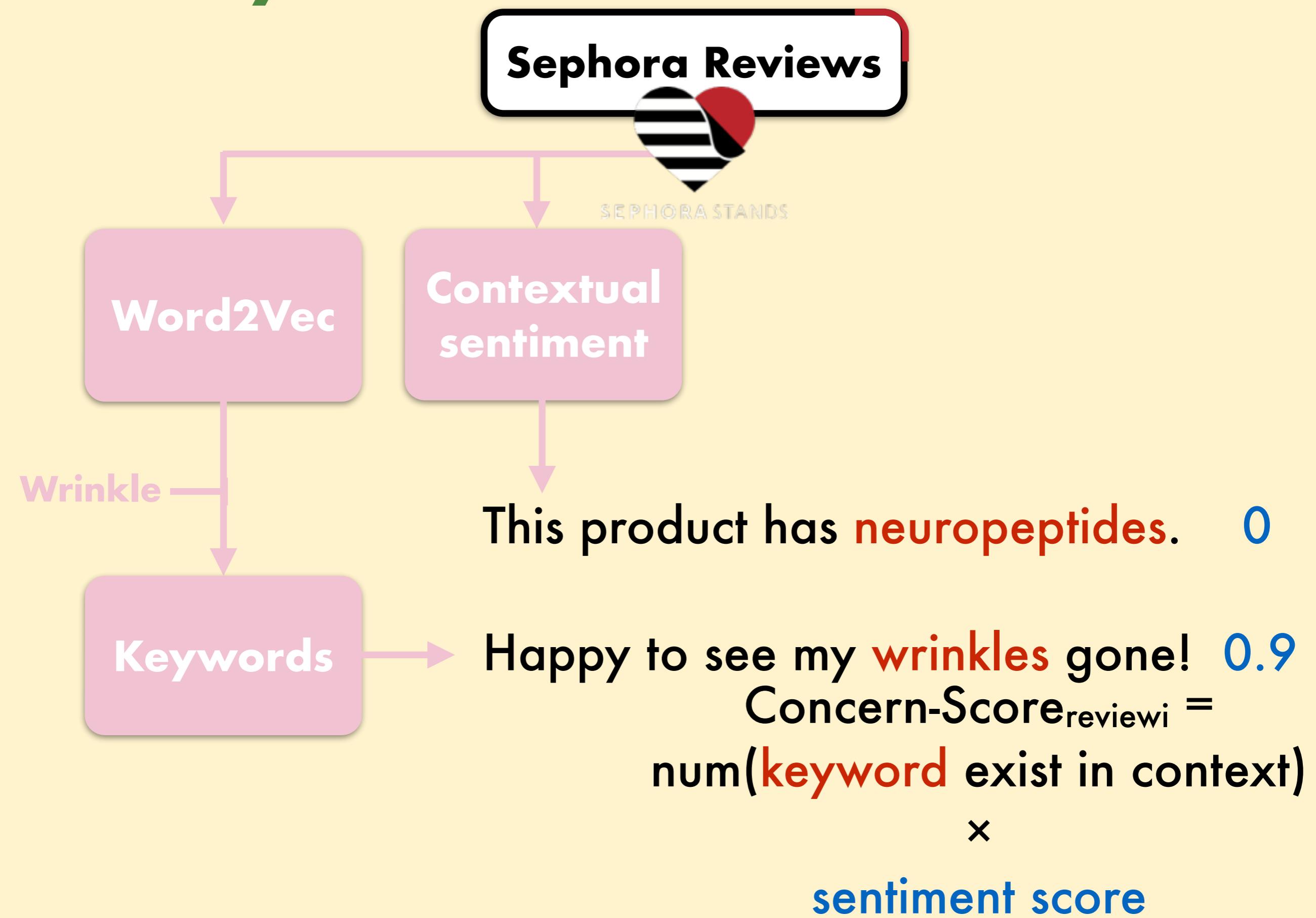
Keywords

This product has **neuropeptides**. 0

Happy to see my **wrinkles** gone! 0.9

[**wrinkle**, ageing, polyphenol, crease,  
aging, elevens, broad, oxidants,  
**neuropeptide**, spectrum, ager]

# Keyword contextual sentiment



# Rank products

Sephora Reviews



SEPHORA STANDS

Word2Vec

Contextual  
sentiment

Wrinkle

Keywords

Concern-Score<sub>productj</sub> =  
sum(Concern-Score<sub>reviewi</sub>)

# Rank products

Sephora Reviews



SEPHORA STANDS

Word2Vec

Contextual  
sentiment

Wrinkle

Keywords

Best  
anti-wrinkle  
products



**Ciao Bella!** ❤

<http://23552.club>

# Bella vs. Sephora

Bella:



**LANCER**  
Advanced Retinol Treatment  
**\$95.00**

★★★★★



**DR. BRANDT SKINCARE**  
MAGNETIGHT Age-Defier™  
Mask  
**\$24.00 - \$75.00**

★★★★★



**PETER THOMAS ROTH**  
AHA/BHA Acne Clearing Gel  
**\$54.00**

★★★★★



online only

**THE ORDINARY**  
"Buffet"  
**\$14.80**

★★★★★



**ESTÉE LAUDER**  
Advanced Night Repair  
Synchronized Recovery  
Complex II  
**\$98.00**

★★★★★



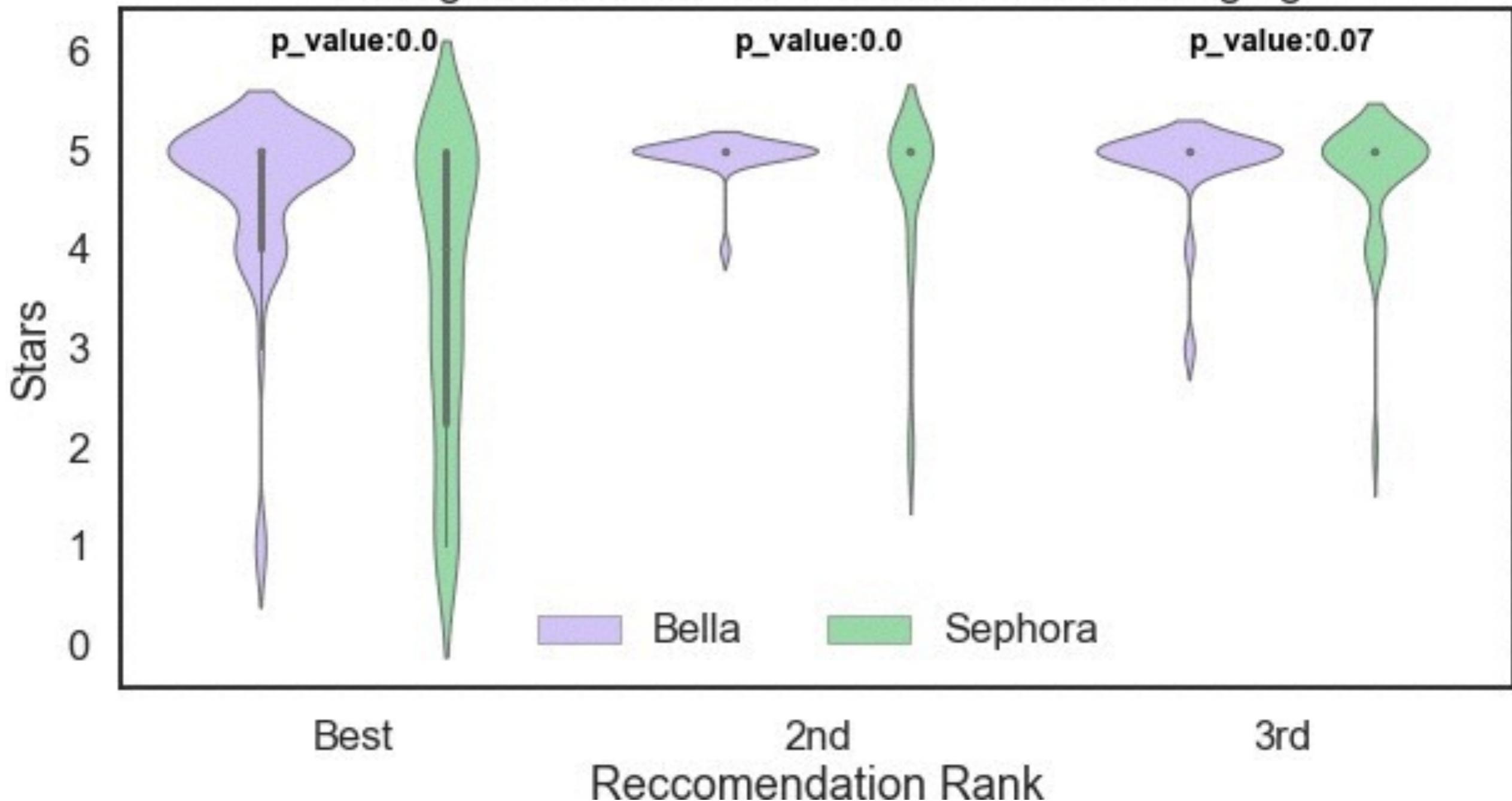
**DRUNK ELEPHANT**  
D-Bronzi™ Anti-Pollution  
Sunshine Drops  
**\$36.00**

★★★★★

Sephora:

# Bella win!

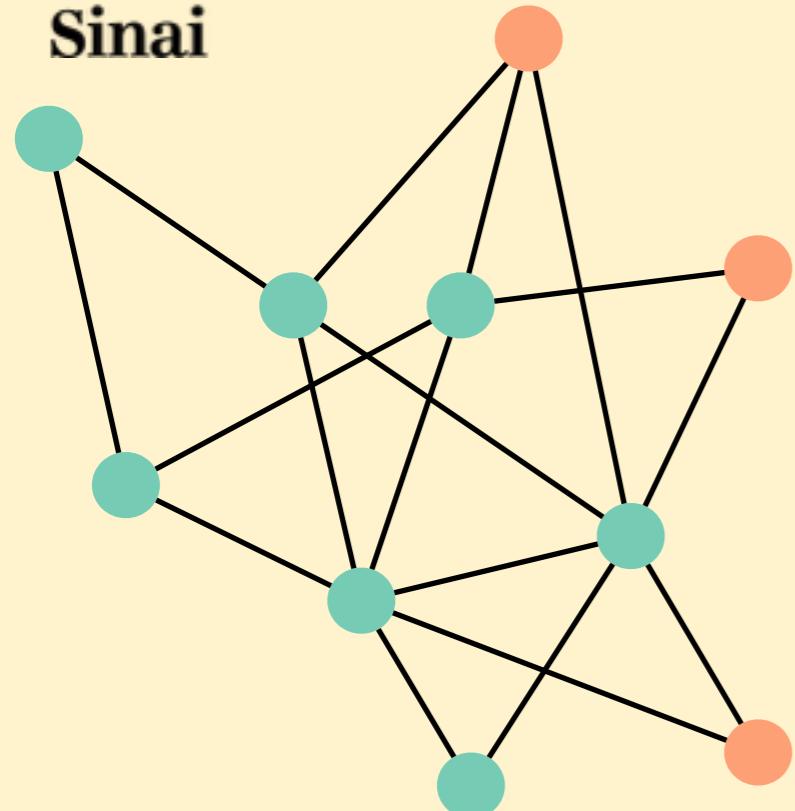
Ratings from Customers Concerned about Aging



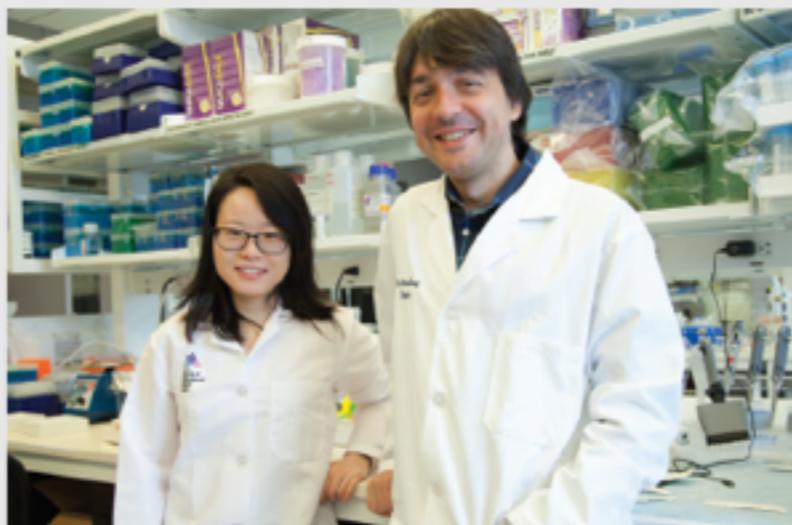
# Nan Shen



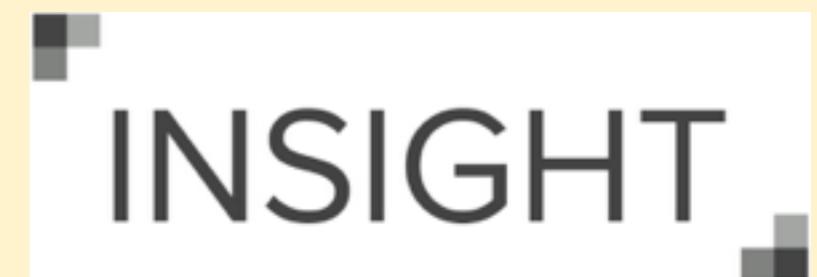
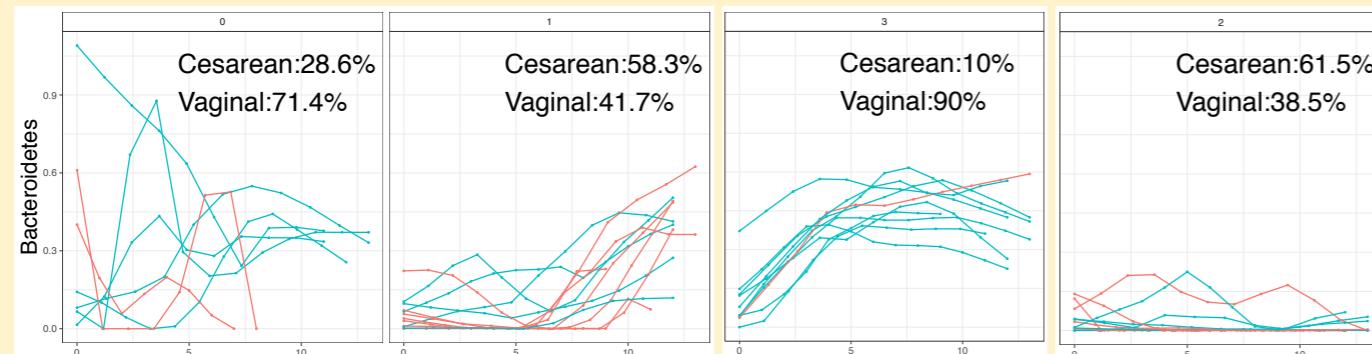
Icahn  
School of  
Medicine at  
Mount  
Sinai

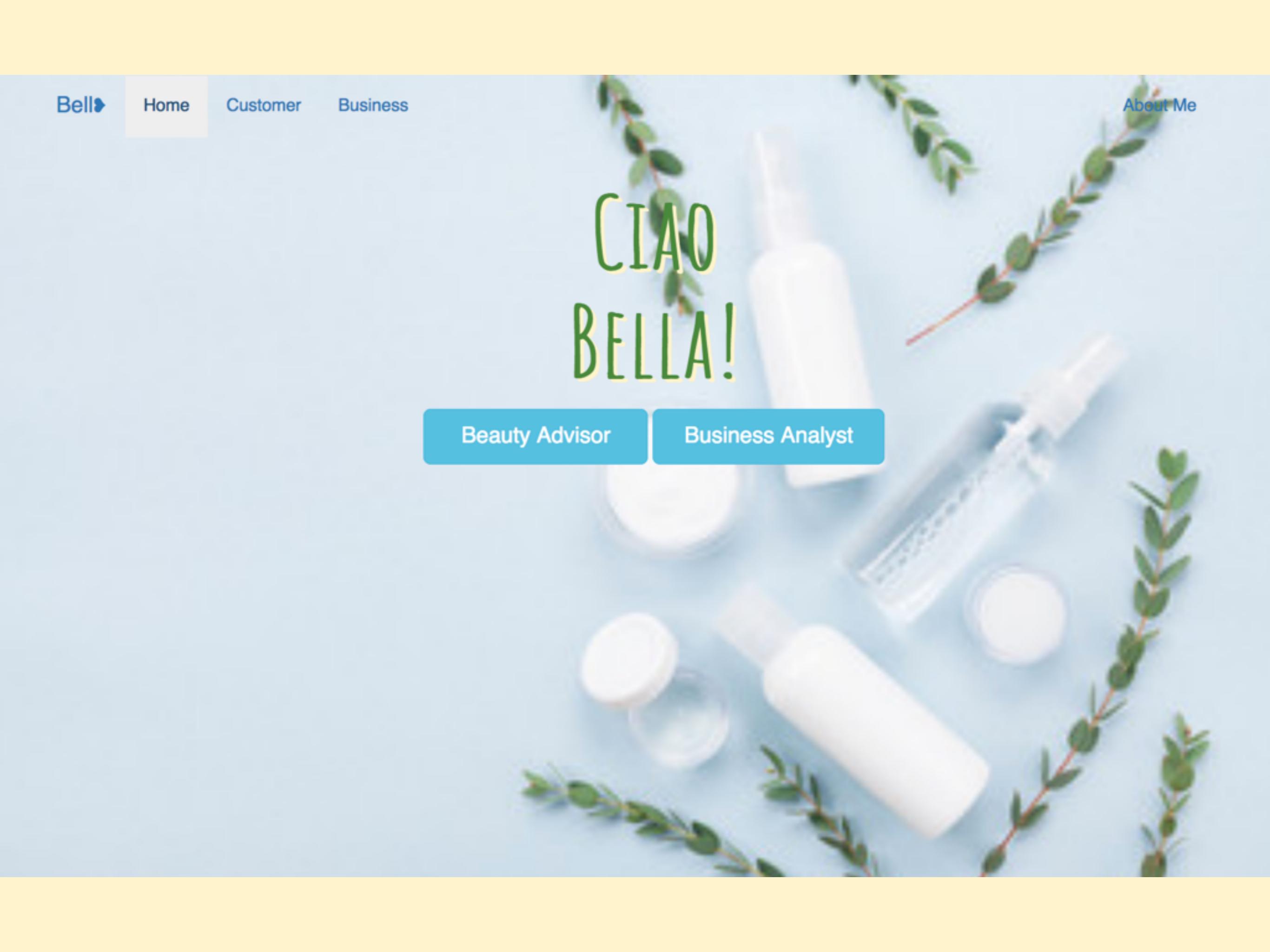


## Dean's Quarterly



PhD candidate Nan Shen and Jose C. Clemente, PhD, are documenting the bacteria and bacteria-encoded functions of the Yanomami Amerindians in Venezuela.





CIAO  
BELLA!

A background photograph featuring several white skincare bottles with pump dispensers, arranged diagonally from top-left to bottom-right. The bottles are set against a light blue surface. Green eucalyptus branches are scattered around the bottles, particularly along the top and right edges, creating a natural, spa-like aesthetic.

Beauty Advisor

Business Analyst

## Bella Beauty Advisor

What are you looking for today?

### Product Types

Serum



Go

Any special concerns? e.g. acne, sensitive

### Skin Concerns

aging

Product	Details
	Lancer Advanced Retinol Treatment  - Fine lines and wrinkles- Dullness and uneven texture- Loss of firmness and elasticity
	Dr. Brandt Skincare MAGNETIGHT Age-Defier Mask  - Dullness and uneven texture - Loss of firmness and elasticity
	Peter Thomas Roth AHA/BHA Acne Clearing Gel  A potent oil-free formula that minimizes the appearance of blemishes

## Bella Business Analyst

Which topic are you interested in?

Topics

make up

Group people by:

Customer Group

Age

Random Reviews

Go

Looking good all day!. I am an oily girl but I love liquid foundation and luminosity in products. This product works wonders to keep me mate while still using things like Tarte Rainforest of the Sea foundation, highlighter, etc. I put it on after primer in my oily areas and let set before applying foundation. I do use it once more over my makeup (carefully pat very little product, no rubbing) once the oil starts to appear (around 3 hours later) and this keeps me matte for hours longer! Also makes my pores look tiny! Love.

pretty wonderful. was little skeptical about this but curious and wanted to try it. SO glad I did. This is wonderfull! It somehow covers flaws and still looks natural and not a made up look. You can layer it to obtain perfection for your own specific skin. Only drawback I think is if you have very fair skin it might not work perfectly, I don't know if it would indeed work for everyone. With darker skin you could probably mix it with the bronzer to find a perfect match for your specific skin tone. I have light to medium skin and it is perfect for me. Give it a try!

