

Visualizing skin hydration of a hand disinfectant

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Introduction

Healthy skin is fundamental to hand hygiene, the most effective infection control measure in healthcare facilities¹. Therefore, skin-friendly hand disinfectants are essential for skin health, especially for professional users.

An intuitive, illustrative and more compelling way of assessing and presenting positive product attributes could encourage compliance with hand hygiene.

Aim

The aim was to establish a new method to assess and illustrate skin hydration in comparison to conventional corneometry:

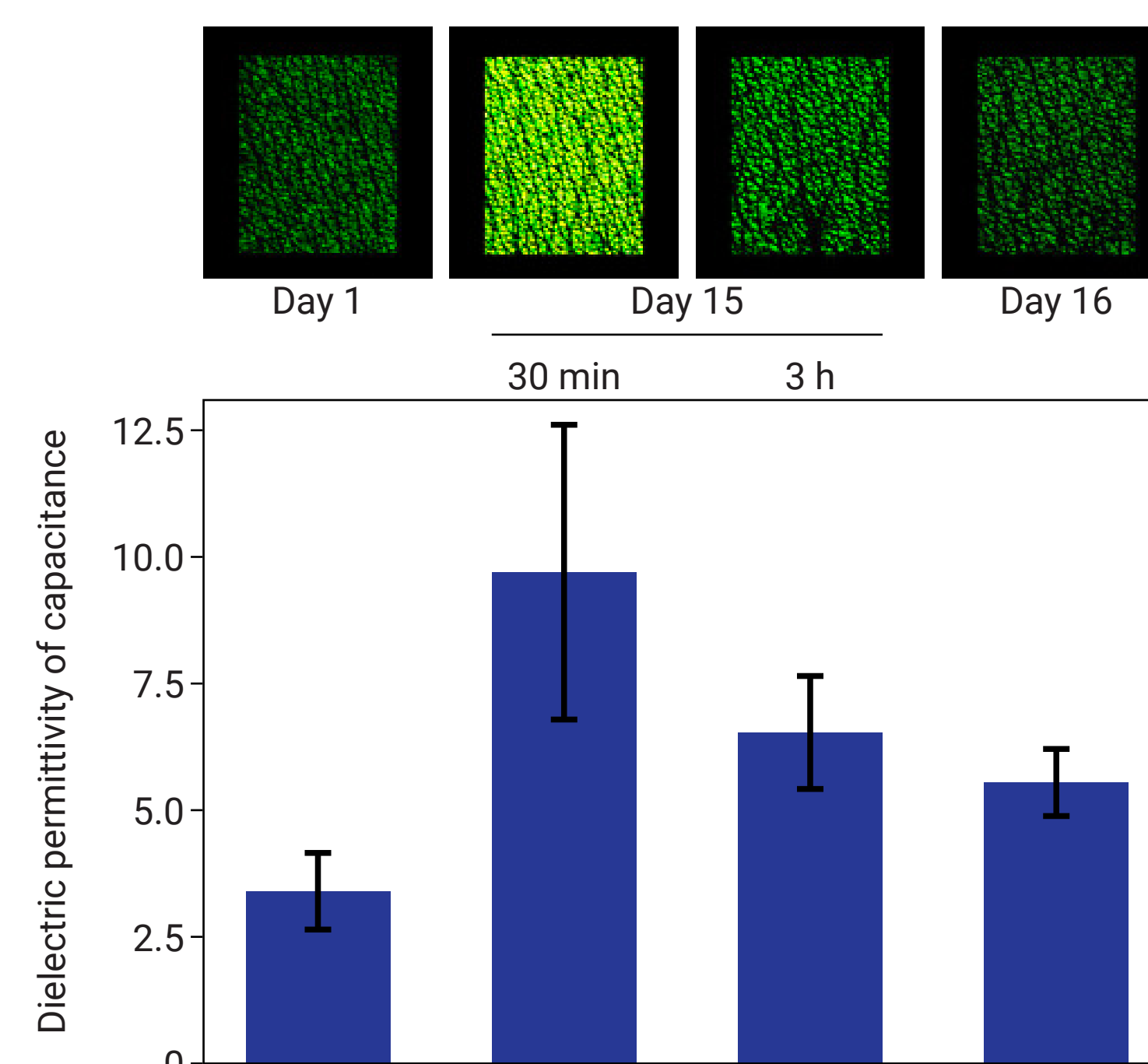
Capacitive Contact Imaging (CCI)²

Method

- 2-week exploratory, open label, randomised study
- 24 test persons (60% females and 40% males) with healthy or unhealthy skin
- 20 product applications/day
- Assessment on Days 1, 15 and 16 of:
 - Skin hydration (Corneometer)
 - Skin permittivity and hydration (CCI)
 - Tolerability assessment by dermatologist and subject questionnaire

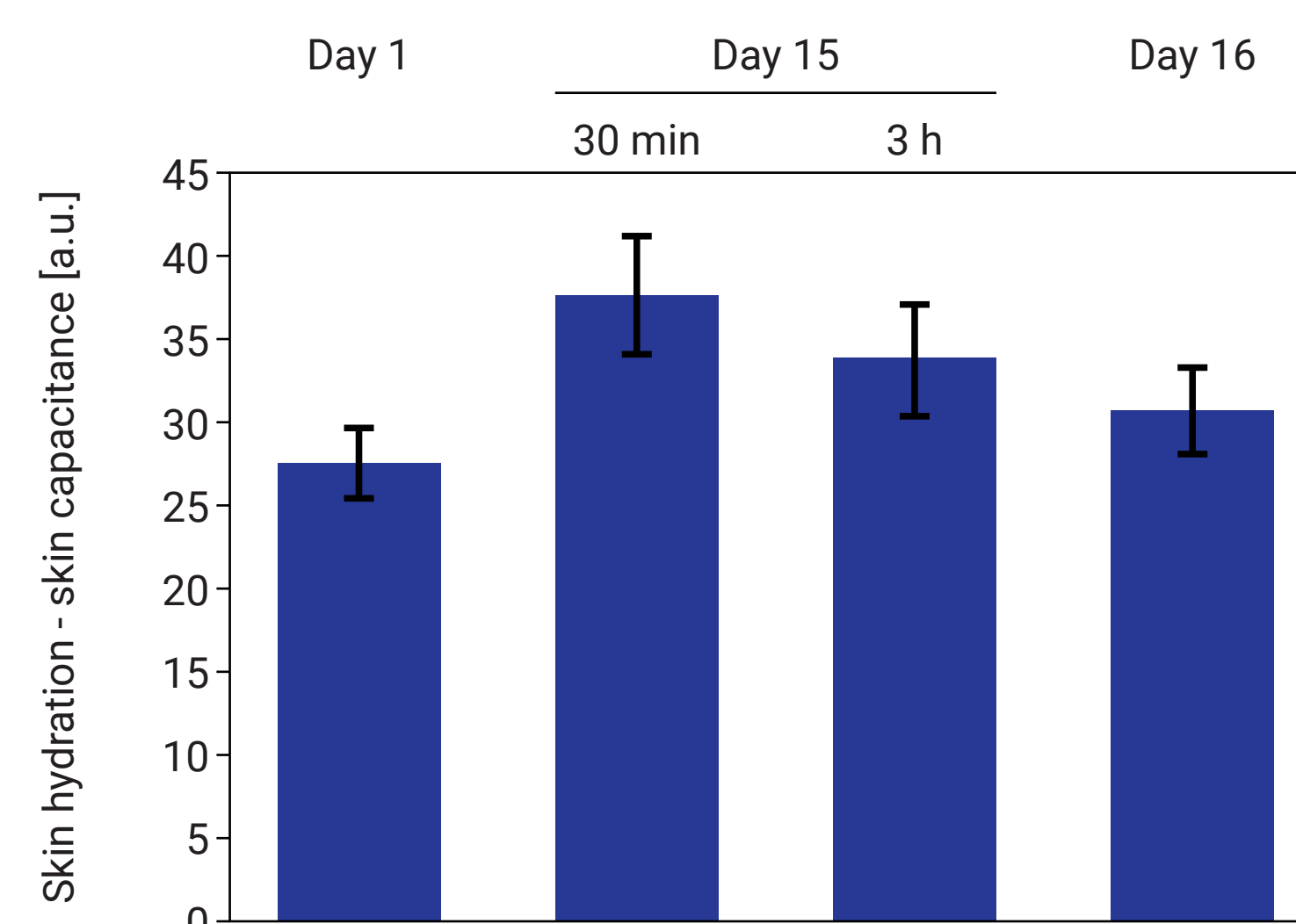
Results

Capacitive Contact Imaging (CCI)



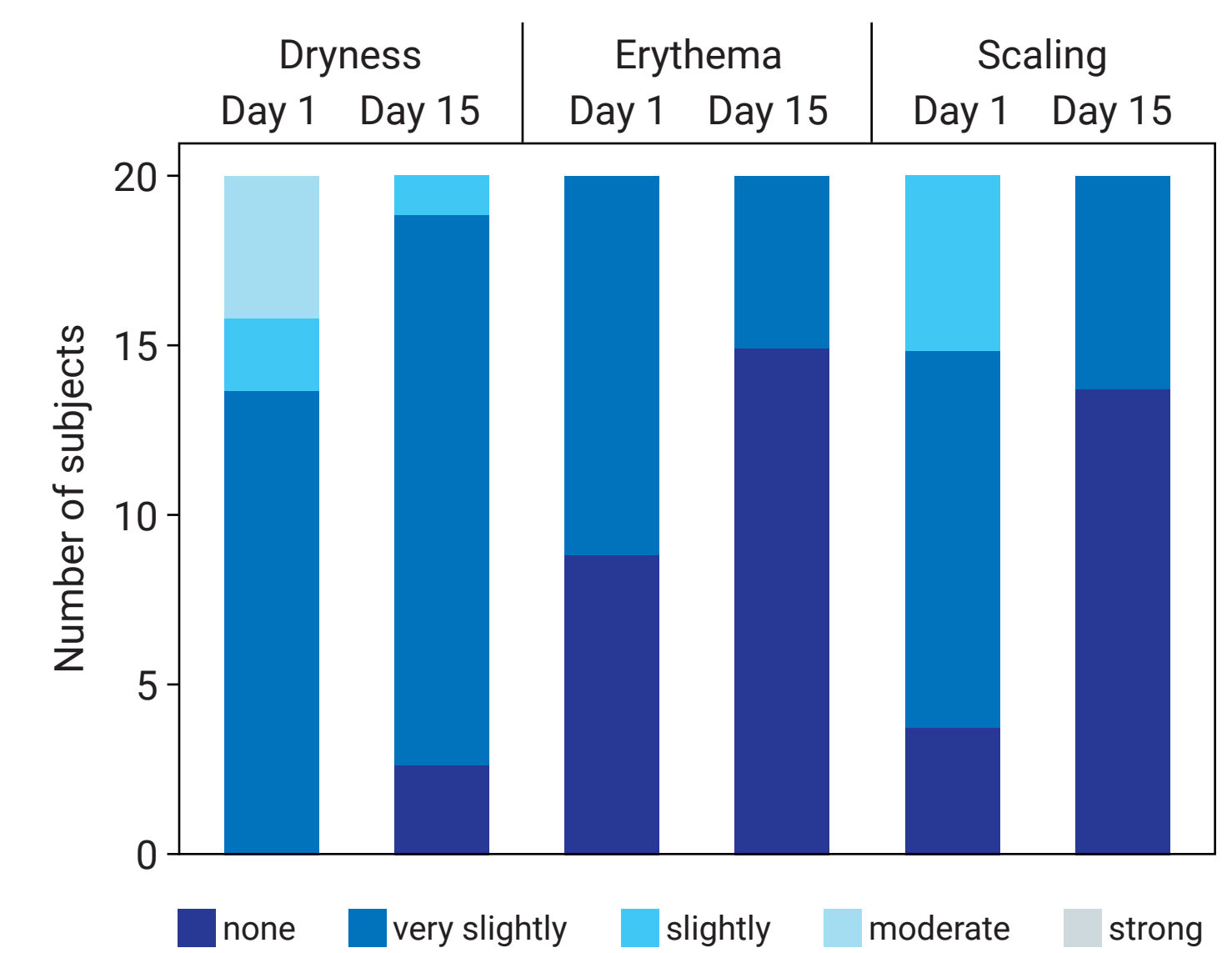
The skin hydration of the test subjects was measured at the beginning of the study before use of the product (day 1) and 30 min after the last use as well as 3 h later. To investigate the long-term effect, the measurements were repeated the next day. CCI uses fingerprint sensor technology to measure and visualize skin hydration. Better skin hydration leads to brighter images. The image above shows the CCI images of one subject over the course of the study and the bar chart the mean values of the image analysis of all subjects and 95% confidence intervals of raw data (n= 19-20).

Corneometry



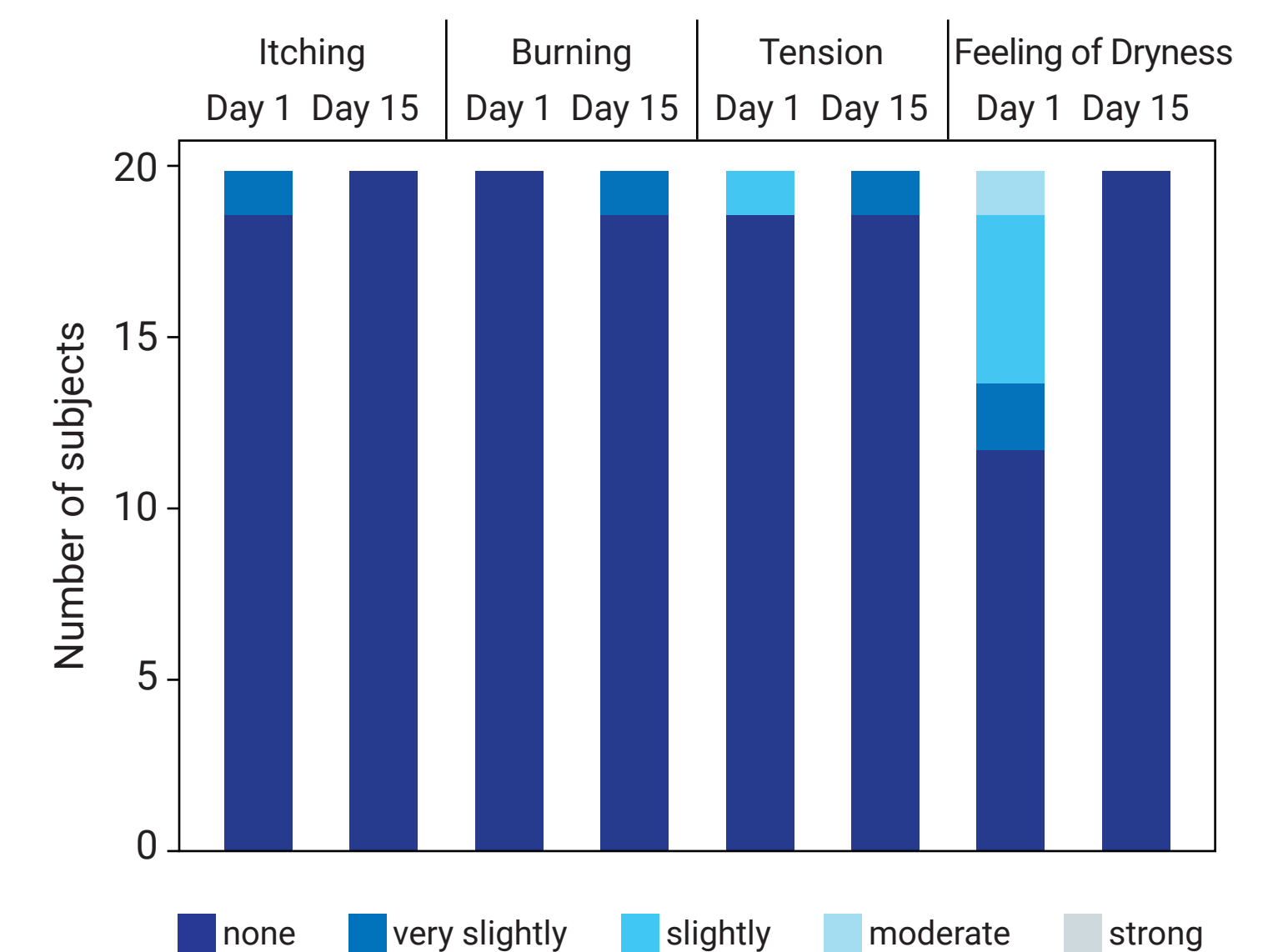
Corneometry was used to confirm the CCI results. Subjects skin hydration was assessed at the beginning of the study before use of the product (day 1) and 30 min after the last use as well as 3 h later. To investigate the long-term effect, the measurements were repeated the next day. Compared to baseline, significantly higher skin capacitance (hydration) values were obtained at all post-treatment time points.

Dermatological Assessment



A dermatologist assessed the skin of 20 subjects before (day 1) and after 2 weeks of use (day 15). After 2 weeks of product application, the subjects' skin improved in terms of parameters such as erythema, dryness and scaling. Other parameters such as fissures, papules, pustules, edema, vesicles and weeping were not observed at beginning and end of the study.

Subject Questionnaire



The subjects self-assessment included the parameters itching, burning, tension and feeling of dryness. No subject reported tickling at beginning or end of the study.

Conclusions

- Skin hydration assessment by CCI yielded equivalent results to conventional gold standard corneometry
- CCI has the added benefit of visualizing skin hydration. The product tested showed a consistent skin hydrating effect and very good tolerability with repeated use
- The good tolerability was also confirmed by the dermatologist and by the subjects' self-assessment

Acknowledgement

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References

1. World Health Organization. WHO Guidelines on Hand Hygiene in Health Care. First Global Patient Safety Challenge Clean Care is Safer Care. 2009.
2. Imhof, B. „Stratum corneum hydration measurement using capacitance contact imaging.“ 2017.

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