REVISION

Writing,
Rhetoric,
And
Professional
Communication

In peer review groups, discuss each draft for 20-30 minutes.

Introduction

Overall organization

Comprehensiveness

Source citation and integration

Metadiscourse

Sentence structure

Reflection:

What lessons did you learn from reading and discussing your peers' drafts?

What suggestions for revision did your peers offer?

What do you want to focus on in your revision?

Reverse outlining can help improve overall organization.

Fxn of CRISPR in bacteria

Role of "spacers"

Stages of CRISPR immunity

6 types of Cas proteins

CRISPR-Cas (clustered regularly interspaced short palindromic repeats-CRISPR associated) adaptive immune systems are found in roughly 50% of bacteria and 90% of archaea (Makarova et al., 2015). These systems function alongside restriction-modification systems, abortive infections, and adsorption blocks to defend prokaryotic populations against phage infection (Labrie et al., 2010). Unlike other mechanisms of cellular defense, which provide generalized protection against any invaders not possessing countermeasures, CRISPR immunity functions analogously to vertebrate adaptive immunity by generating records of previous infections to elicit a rapid and robust response upon reinfection.

CRISPR-Cas systems are generally defined by a genomic locus called the CRISPR array, a series of ~20–50 base-pair (bp) direct repeats separated by unique "spacers" of similar length and preceded by an AT-rich "leader" sequence (Jansen et al., 2002; Kunin et al., 2007). Nearly two decades after CRISPR loci were first identified in *Escherichia coli*, spacers were found to derive from viral genomes and conjugative plasmids, serving as records of previous infection (Bolotin et al., 2005; Ishino et al., 1987; Mojica et al., 2005; Pourcel et al., 2005). Sequences in foreign DNA matching spacers are referred to as "protospacers." In 2007, it was shown that a spacer matching a phage genome immunizes the host microbe against the corresponding phage and that infection by a novel phage leads to the expansion of the CRISPR array by addition of new spacers originating from the phage genome (Barrangou et al., 2007).

stage involves CRISPR locus transcription, often as a single pre-crRNA, and its subsequent processing into mature crRNAs that each contain a single spacer. In the interference stage, an effector complex uses the crRNA to identify and destroy any phage or plasmid bearing sequence complementarity to the spacer sequence of the crRNA.

These steps are carried out primarily by Cas proteins, which are encoded by *cas* genes flanking the CRISPR arrays. The specific complement of *cas* genes varies widely. CRISPR-Cas systems can be classified based on the presence of "signature genes" into six types, which are additionally grouped into two classes (Figure 1B) (Makarova et al., 2011b; Makarova et al., 2015; Shmakov et al., 2015). Types I–III are the best studied, while Types IV–VI have only recently been identified (Makarova and Koonin, 2015; Makarova et al., 2015; Shmakov et al., 2015). The signature protein of Type I systems is Cas3, a protein with nuclease and helicase domains that functions in foreign DNA degradation to cleave DNA that is recognized by the multi-protein-crRNA complex Cascade (CRISPR-associated complex for antiviral defense). In Type II systems, the signature *cas9* gene encodes the sole protein necessary for interference. Type III systems are signified by Cas10, which assembles into a Cascade-like interference complex for target search and destruction. Type IV systems have Csf1, an uncharacterized protein proposed to form part of a Cascade-like complex, though these systems are often found as isolated *cas* genes without an associated CRISPR array (Makarova and Koonin,

Let us consider this list of topics.

Claim: Deinstitutionalizing mental patients in the late 20th-century led to transforming the “hobo” to the “homeless person”.

1: Image of the hobo before World War II

2: Image of the homeless person today

3: Effects of deinstitutionalization

4: History of deinstitutionalization

5: History of the Depression; how the Depression is both different and similar to the time period of deinstitutionalization; incorrect beliefs about the causes and timeframe of deinstitutionalization

6: Policies of Reagan’s administration on deinstitutionalization

7: Realities of life as a “homeless person” vs. romantic notions of “riding the rails”

Adapted from https://twp.duke.edu/sites/twp.duke.edu/files/file-attachments/reverse-outline.original.pdf

Break up paragraphs that have too many topics.

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→ 5: History of the Depression; how the Depression is both different and similar to the time period of deinstitutionalization; incorrect beliefs about the causes and timeframe of deinstitutionalization

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Determine whether paragraphs support thesis (overall claim).

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Reconsider organization.

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Paragraph flow depends on two things.

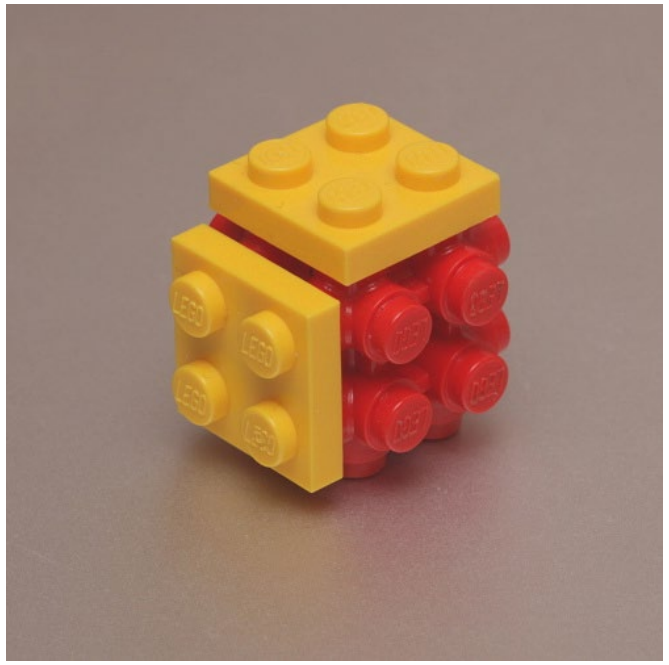

Image courtesy of Pasukaru76 on flickr. This image is in the public domain.

Cohesion

Coherence

Improve cohesion by beginning with old, ending with new.

[Potential intensity (PI)] trends themselves are subject to considerable uncertainty, with different observational data sets showing disagreement, particularly outside the North Atlantic. Climate model simulations indicate that during the late 20th century, greenhouse gas and aerosol radiative forcing had opposite and, until very recently, largely **cancelling effects** on PI. **This cancellation** renders radiatively forced trends in PI and actual intensity small and thus **difficult to detect** in the presence of large natural variability. **Detection of trends** in actual intensity is further complicated by data inhomogeneities and other observational limitations and by systematic poleward shifts in the storm tracks.

Improve cohesion with transition and structural terms.

Over this period, the global LMI distribution assessed from best-track data had positive trends in the mean (2 m s–1 decade–1) and in its quantiles (>2 m s–1 decade–1 for quantiles > 0.4). **In contrast,** the LMI distribution from a novel satellite-based data set, designed to be temporally homogeneous, had a mean trend (<1 m s–1 decade–1) and quantile trends that were insignificant.

The regional model is well suited for this study for several reasons. **First**, the use of lateral boundary conditions (LBCs) allows us...**Second**, whereas global climate models typically use...**Finally**, the regional domain allows us to perform ensembles of simulations at convection-permitting resolution, which would be computationally less feasible with a global model.

Improve coherence by keeping sentence topics consistent.

The frequency of [tropical cyclone (TC)] occurrence is much less well understood than is TC intensity. **About 90 ± 8 TCs** form on Earth each year (33, 34). In contrast to the situation for intensity, **no physical theory** predicts this number, even to an order of magnitude, despite intense research activity on mechanisms controlling the genesis of individual TCs [e.g., (35, 36)]. Subseasonal to interannual **variations in TC frequency** are widely diagnosed using semi-empirical genesis indices (37–40), but using these to predict future global changes requires a problematic out-of-sample extrapolation (41, 42).

Convey actions in verbs, not nouns or adjectives.

The **intention** of the committee is to evaluate the proposals.

*The committee **intends** to evaluate the proposals.*

Rate of increase **is strongly dependent** upon factor X.

*Rate of increase **strongly depends** upon factor X.*

Improve coherence by stating paragraph topic by end of second sentence.

The North Atlantic changes are of great regional interest in North America. **Their causes and implications** for the future are the subject of debate. The increase in TC activity in the late 20th century coincided with both absolute and relative warming of the North Atlantic SST. The absolute warming is likely to continue, whereas the relative warming [which has a stronger influence on PI; for example, (65–67)] is not, at least not at the same pace. This implies that future increases, if they occur at all, will be more gradual. More in-depth arguments focus on the specific reasons for the Atlantic warming and associated PI changes, with roles for radiative forcing from greenhouse gases, aerosols, and ozone depletion, as well as internal variability in the Atlantic basin (19, 67–72).

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