

# GUT CHECK: THE MICROBIOME GAME

**BY DAVID COIL**

"I'm going to raid the  
pharmacy, treat you with tetracycline,  
and then give you a fungal infection."

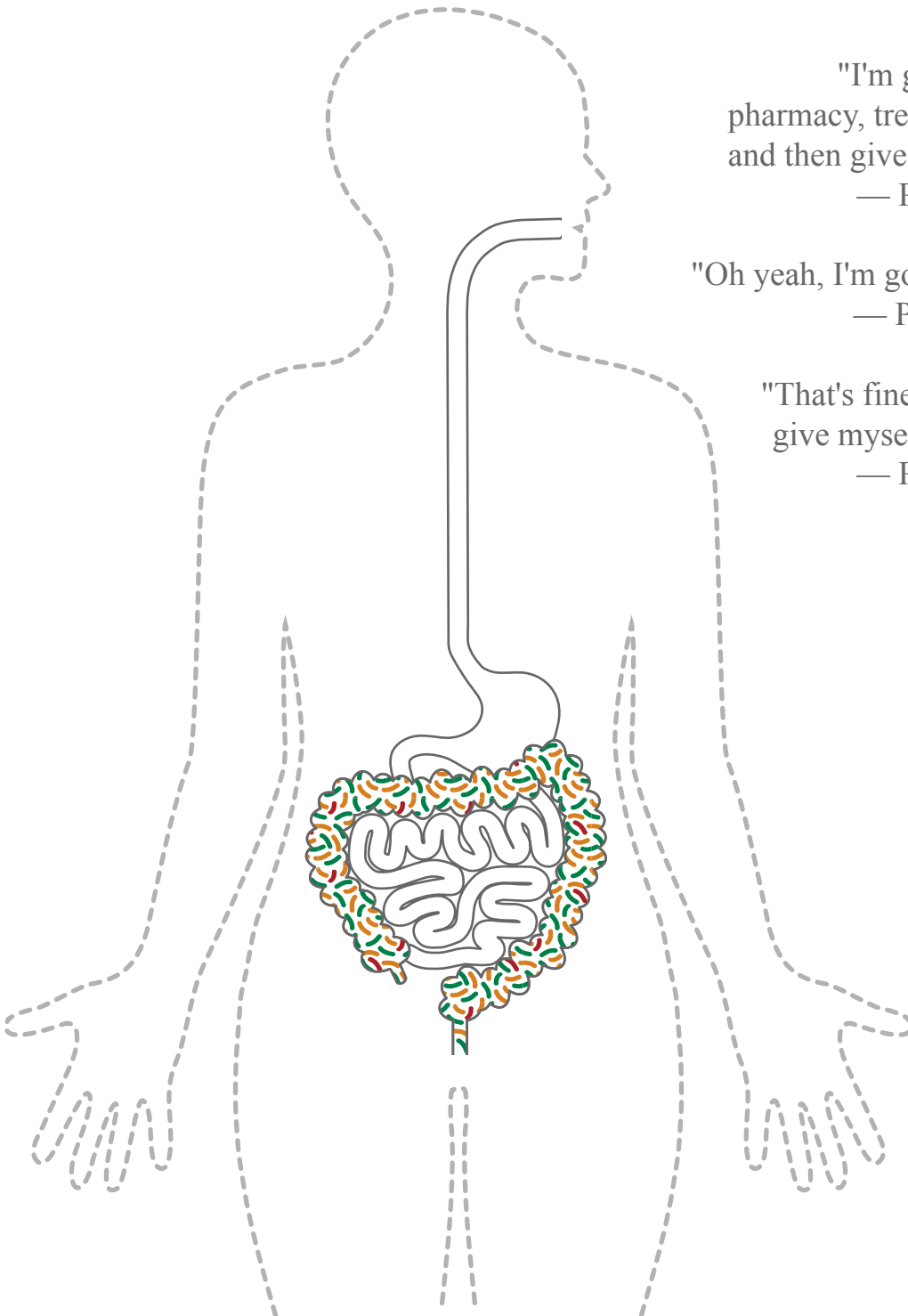
— PLAYER ONE

"Oh yeah, I'm going to give you botulism!"

— PLAYER TWO

"That's fine because I'm going to  
give myself a fecal transplant."

— PLAYER ONE



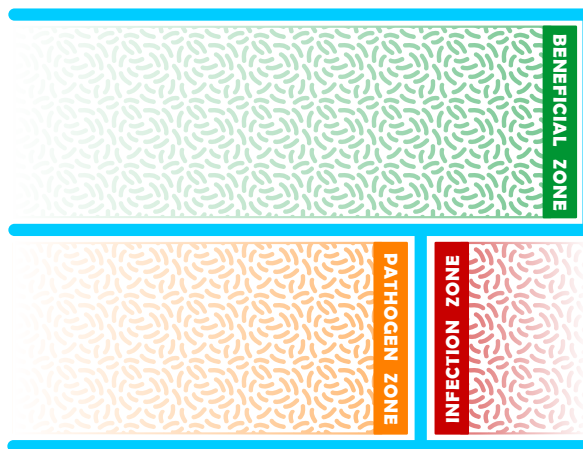
# SHORT VERSION OF THE RULES (FOR PEOPLE WHO DON'T LIKE TO READ)

1. You can only play one Microbe per turn, otherwise play as many cards per turn as you'd like.
2. Pathogens go in the Pathogen Zone, Beneficials go in the Beneficial Zone, Opportunistics go in either. You can play Microbes on any player.
3. Once per turn you can discard a card and take one of the face-up cards from the middle.
4. At the end of your turn, draw back up to a hand of 5 cards.
5. When a Gut Check card is drawn, everyone immediately scores their microbiome, health is indicated on the cards depending on which zone the Microbe is in.
6. If someone plays an Antibiotic card, each surviving microbe receives a plasmid card of the appropriate type to indicate that it is now resistant to that Antibiotic.
7. The game ends when the last card is drawn. Each other player gets a final turn and then there is a final Gut Check. The player with the most health wins.

## GAME SETUP

In Gut Check, 2-4 players compete to develop the healthiest microbiome, while attempting to disrupt each others efforts.

1. Give one play sheet and Key card to each player, put the main board in the center
2. Set all Plasmid cards in a face-up pile as indicated on board
3. Shuffle the remaining cards and give 5 to each player. If a player has a hand with 0 or 5 Microbes then the player can redraw and shuffle their discarded hand into the deck. Repeat as needed. Discard and replace any Gut Check cards that appear during setup.
4. Deal 3 cards face up on the indicated area of the board (shuffle any Gut Check cards back into the deck)
5. Each player starts at 10 health, indicated by placing tokens on the board
6. The player who has most recently eaten yogurt goes first, play proceeds clockwise



Play Sheet



Key Card

# CARD TYPES

There are three types of cards in the main deck; **MICROBES**, **EVENTS**, and **INFECTIONS**.

**MICROBES** (blue): These represent bacteria that you are using to either make a healthier microbiome for yourself, or to disrupt your opponents microbiome(s). See the Main Phase rules for playing Microbes. Microbes stay in play unless destroyed.

**EVENTS** (purple): These cards are played, their effect is resolved, and they are discarded. Some of them increase or decrease a player's health. These effects are indicated in the green and orange triangles on the card and occur instantly. You can play Events for no effect, but only if there is a valid target (e.g. a Milk card can be played even if it has no effect, but a Lateral Gene Transfer card can only be played if a plasmid is in play).

**INFECTIONS** (red): Infections are played into the Infection Zone on a player and remain in play until the conditions described on the card are fulfilled. They are not considered Microbes and are therefore immune to cards such as Bacteriophage Therapy and the various antibiotics. They are scored during Gut Checks, similar to Microbes.

card type —

microbe type —

microbe name —

description —

flavor text —

When in your Beneficial Zone, use these points to score your microbiome during a Gut Check

Center icon(s) indicate your digestion/production abilities (see Key card)

When in your Pathogen Zone, use these points to score your microbiome during a Gut Check

card type —

event type —

description —

flavor text —

card type —

infection type —

description —

flavor text —

Use these points to score your microbiome during a Gut Check

# A MID-GAME EXAMPLE OF PLAY

This player has two Beneficial Microbes, two Opportunistic Microbes (both currently in the Beneficial Zone), two Pathogen Microbes, and a Nosocomial Infection. Note that multiple copies of the same Microbe are allowed, and that the number of possible Microbes/Infections is not restricted by available board space. If a Gut Check were drawn right now, this player would lose two health (+5 from the Beneficial Zone, -4 from the Pathogen Zone, and -3 from the Infection). Two of the Microbes in the Beneficial Zone currently carry Tetracycline Resistance Plasmids, and both of the Pathogen Microbes are naturally resistant to Tetracycline. Therefore, treatment of this player with Antibiotic: Tetracycline would result in the loss of only a single Microbe (one of the two in the Beneficial Zone not carrying a Plasmid, since the card states “lose half of their non-resistant beneficial zone microbes”). The remaining Microbe would then receive a Tetracycline Resistance Plasmid.



# TURN ORDER

**1. Main Phase:** During your Main Phase you can play as many cards as you want (including none), with the exception of Microbes. You can only play up to one Microbe per turn (either on yourself or another player). You can never play cards during another player's turn. Cards can be played in any order you'd like.

Playing a Microbe (Optional): Pathogen Microbes can only be played in the Pathogen Zone. Beneficial Microbes can only be played in the Beneficial Zone. Opportunistic Microbes can be played into either zone. Remember that you can play a Microbe on yourself, or on an opponent.

Exchange (Optional): Discard one card from your hand and draw one of the face up cards. You may only do this once per turn but it can happen at any point during the Main Phase. Replace the missing card with the top card of the deck immediately. If it is a Gut Check, then resolve immediately. You can never exchange or trade with other players.

Clear the Middle (Optional): On any turn in which you do not play a Microbe, you can discard the three face-up cards from the middle, and replace them with three new cards from the deck. You can Clear the Middle before doing your Exchange, but still cannot play a Microbe that turn. If any of the cards drawn are a Gut Check, then resolve it immediately and replace it with the top card of the deck.

**2. Draw back to a hand of 5 cards**

**3. Turn ends**

# GUT CHECK

Anytime a Gut Check card is drawn, immediately stop play and resolve the Gut Check. After the Gut Check is resolved, place the Gut Check card face-up in the Used Gut Check Pile as indicated on the board and draw another card to replace it. Keep the discarded Gut Check cards in their own pile so players know how many are left (there are 6 total). Cards that search through the deck (e.g. Probiotics and Raid the Pharmacy) do not trigger Gut Checks.



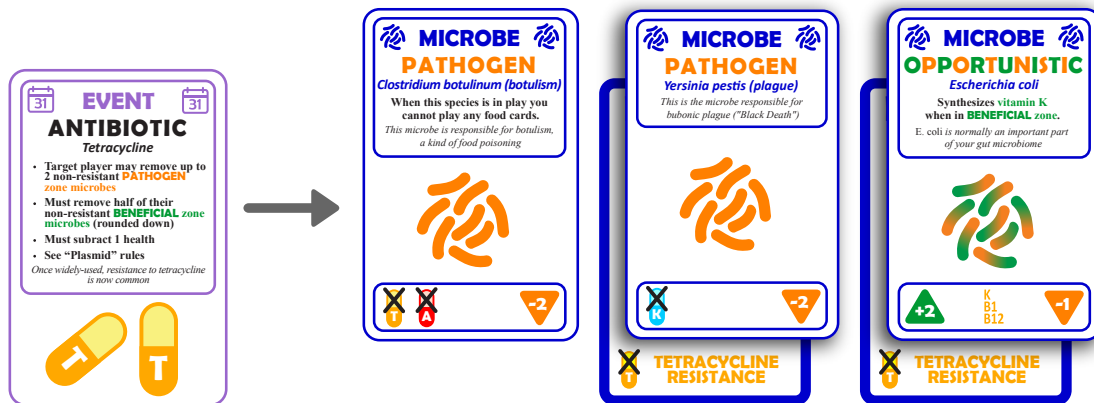
During a Gut Check, you score your microbiome. Microbes in your Beneficial Zone give points as indicated in the green triangles on the card. Microbes in your Pathogen Zone subtract points as indicated in the orange triangles on the card. Infections are also scored at this time. All cards (except for the Gut Check) remain in play after scoring.

There can never be two Gut Checks in the same turn, if a second one is drawn then shuffle it back into the deck. In addition, there cannot be a Gut Check until every player has had a turn.

There is a 7th, automatic, Gut Check at the very end of the game that is not represented by a card.

# PLASMID RULES

Every time Antibiotics are played, all surviving Microbes of the player receiving the Antibiotics get an appropriate Plasmid (e.g. after Antibiotic: Tetracycline is played, the remaining Microbes receive the Tetracycline resistance plasmid). If no Plasmids of the appropriate type are available, nothing happens. This effect does not occur for Microbes which were already resistant to that Antibiotic. When a Microbe carrying Plasmids is destroyed, put its Plasmids back into the Plasmid pile.



# TRACKING HEALTH

Various events during the game, including Gut Checks, cause the player's health status to go up or down as indicated on the board. All players start at 10 health. If a player's health ever reaches zero health, they are dead and all their cards in play and hand are discarded.

# GAME END

The game ends after the deck has been exhausted. The player who draws the last card finishes their turn, then each other player gets one final turn. This is followed by a final Gut Check. The player with the highest health after the final Gut Check is the winner. It is also possible to win if all other players are dead.

## TIPS ON STRATEGY (NOT NEEDED TO PLAY THE GAME)

Don't forget to exchange cards through the middle. Think not only of cards that would benefit you but consider taking cards that you don't want to see played on you, or cards that might help your opponents.

Card cycling (i.e. playing cards for no effect... such as Milk when you have nothing to digest it) can be very useful. If you're doing well, it's potentially worth cycling as much as possible to increase the chances of drawing a Gut Check. If you're doing poorly, you might need to hold back from playing many cards to lower the risk of drawing a Gut Check.

The game plays very differently depending on the number of players. A good strategy with 2 players may not work with 3 or 4 and vice versa.

## NOTES ON MICROBIOLOGY

An attempt has been made to be as scientifically accurate as possible, within the (significant) constraints of making a playable game. The core concepts of the game, e.g. antibiotic resistance, lateral gene transfer, opportunistic microbes etc. are all derived from current knowledge.

However, the real world of the human microbiome is significantly messier than it might appear from this game. Important caveats include the fact that in reality we know relatively little about our own microbiome. It's clear that having a healthy microbiome is important, but much less clear is how to measure that, what species that might involve, how it is influenced by diet/culture/lifestyle etc.

Likewise, nutrition in real life is much murkier than here. While we know that microbes in the gut produce certain vitamins we're often not sure which ones. Likewise it's also unlikely that a single microbe could be responsible for the ability to digest milk, grains, or plants for example... but certainly our total microbiome is intimately involved in these processes.

Game Content and Design: David Coil | [coil.david@gmail.com](mailto:coil.david@gmail.com) | [@davidacoil](https://twitter.com/davidacoil)  
Graphic Design and Illustration: Erin Johnson | [erin.n.johnson@gmail.com](mailto:erin.n.johnson@gmail.com) | [@erinjohnsonae](https://twitter.com/erinjohnsonae)  
Produced by Jonathan Eisen | [@phylogenomics](https://twitter.com/phylogenomics)  
<http://www.gut-check.net/>

*Gut Check: The Microbiology Game* is licensed under the Creative Commons Attribution 4.0 International Public License (CC BY). You are free to distribute, remix, tweak, and build upon this work, even commercially, as long as you credit us for the original creation.

The authors would like to thank the many people who helped with the conception and playtesting of this game. In particular, special thanks to Russell Neches, Madison Dunitz, James Teeple, Dimitri Horaites, Cassie Ettinger, Hannah Holland-Moritz, Ruth Lee, Guillaume Jospin, Katie Dahlhausen, Alex Alexiev, Phil Seitzer, the members of the Eisen Lab at UC Davis, and the Friday Night Game Group. Financial support for this game came in part from the Alfred P. Sloan Foundation.