Rules for Gene Rummy

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THE BIG PICTURE

The main point of this game is to try to understand why, about two billion years ago, a small population of cells decided that mating within species groups was a useful strategy. Bacteria exchange genetic material with all comers, and have done very well for themselves.

Why does it make sense to restrict your options, and decide only to exchange material with members of your own species? Not only is this costly in terms of courtship displays, it reduces the pool of resources you have access to. But in fact, you'll find by playing this game that there are a lot of benefits to strategies involving restricted exchange. I've thought of a few, but good card players might invent others. Each such strategy is actually a hypothesis about biology which I can test. In this sense, this game is about outsourcing all the hard creative aspects of coming up with a hypothesis to a bunch of clever card players. It's a unique way of doing science, not just a pedagogical tool.

Gameplay

During the game, some players are prokaryotes, others are in eukaryotic "species groups" defined by suit, described in the courtship section below. The game is played over several identical sets over which points accumulate. Each set ends when a player declares they have a "meld" described in the endgame section below. The winner gets 2 points, all other members of the same species get 1 point.

Starting each set

The game can be played with $N = 8$ to 12 players, using $N/5 + 2$ standard decks without jokers. At the start of each set, the person to the left of the previous dealer takes over as dealer. Each player is dealt 10 cards. The rest are kept in a pile at the centre. On your turn you always replace some of your cards with fresh cards, so you will always have 10 cards in your hand. The set is played in two seasons: the courtship season and the mating season.

Courtship (Bidding rounds)

Players take turns clockwise, starting from the left of the dealer. On your turn, you place a card from your hand face-up on the table, and take fresh card from the deck. The suit of your open card indicates the suit you are bidding to win on, presumably your strongest suit. But by advertising your strength, you weaken your hand, reflecting the cost of courtship displays. If you prefer to play the prokaryotic strategy (i.e. you "go pro"), then you may place your card face down meaning that you are not bidding for any suit. After a round of bidding, players take a look at everyone's bids. Then bidding starts again. You can change your mind each bidding round, but prokaryotes can no longer bid. Rounds of bidding keep going until no player changes his or her bid.

We do multiple rounds of bidding because there is a second purpose to open bidding: namely to break up players into "species groups" based on suit. All players who, for example, play diamonds are constrained during the mating season to exchange cards only among themselves, not from the deck. In contrast, bacterial players can only exchange cards from the deck, not from any other players. So, it is useful to play a suit that a lot of others are playing, you then have a lot of potential partners. But of course, that means you also have a lot of competitors within your own species group

Mating (Main rounds)

Players take turns clockwise, starting from the left of the dealer. If you are a prokaryote player, you place one of your cards face down and take a fresh card from the central deck representing the bacterial "pan genome". For eukaryotes, turns go between "play left", "play right", and "play the deck". On your turn, you select two of your cards and put them face down, on your left, right, or in front of you. You then pick up the corresponding cards on the opposite side of you, from the closest member of your own species, or from the deck if it is a deck round.

Endgame

A "meld" must include a single natural sequence: a set of cards of the same suit and consecutive values, which can wrap around the Aces, e.g. Q K A 2 of diamonds. All the other cards must not have values other than the ones in the natural sequence, but can belong to any suit. So, e.g. with the Q K A 2 of diamonds, the other six cards must have one or more of these four values. For prokaryotes, the natural sequence can be of any suit. For eukaryotes, it must belong to the species suit. Natural sequences can be of any length, from 1 to 10 (if 1, then all cards in the hand must be of the same value; if 10, then all cards belong to the natural sequence and there are no duplicates).

If, on any round, you find that you have achieved a meld, declare victory and open up your hand for all to see. Multiple players might win on a given round. Points are then

recorded and a new set begins. Bidding is completely new, not determined by the suit you bid in the previous set.

Optional: Infection

In the infection version of the game, when eukaryotes exchange with the deck they must place one card face up and another face down. At the end of any round, any prokaryote player can pass a card to some eukaryote; if the eukaryote has exactly the same card (suit and value) then he or she is said to be infected and drops out of the game. The prokaryote is allowed to see the eukaryote's hand retrieve a single card for their own.

Like any card game, the rules are the easiest part. The winning strategy is the difficult, non-obvious part. I don't know what the winning strategy is, but am hoping you will find one.